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RESEARCH ARTICLE

ETHNOMEDICINAL STUDY OF FLORA OF DISTRICT KARAK, KHYBER PAKHTUNKHWA, PAKISTAN

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Abstract

The present attempt was carried out for the exploration and documentation of ethno medicinally important flora of Union Council Ahmad Abad District Karak, Pakistan. Data was carried out through out the year depend upon the availability of medicinal plants. A questioner method was used to interview people of different age mostly old men and women and hakims who were more well-known with indigenous knowledge about medicinal plants. Total 43 plants belonging to 39 genera and 24 families were recorded. In which about 30 plants were treated for different dieses most of them were used as a pain killer (9 spp), skin disorder (6 spp) and for fever, (5 spp). Most of the plants were herbs there for most of them were used as a whole plant for treatment of ailment. The dominant specie was solanaceae (5 spp) followed by asteraceae and euphorbeaceae (4 spp each) and zygophylaceae (3 spp). The area of Ahmad Abad is rural and the people are mostly depending on plants for survival. They used the plants as medicines, fodder and fuel to earn money. Most of them are uneducated and they cutting the plants unwisely and collecting plants unsustainably. As a result the flora of investigation area is in thread. There for the inhabitants of the study area should be train to know the value of plants and to utilize the plant wealth sustainably.

Introduction

Prehistoric mankind intimately linked in the nature and depends directly on it for his survival for food, shelter, fuel, medicine, and fodder. Development of human life and civilization has directly or indirectly been correlated with and affect by the surrounding environments. The life and diet system of human is totally depended on the plants. Pants are important, cost effective, nontoxic, more affective and easily available source of medicine. Plants are fundamental source of traditional medicines for the treatment of various illnesses.[1]Bako Sp,(2005). Round about 2, 50,000 species of the plants have been used through out the world for medicinal purposes.[2]Himiloton,(1993).Ethnobotanical research is of immense importance to highlight the significance of plants and to bring awareness about the conservation of wild flora.[3]Balick,M.J,(1998). Plants are utilized by the mankind to meet a variety needs. Plants provide food, shelter, fibers, fodder and fuel. Wild herbs have been known to be the sources of pharmacologically important compounds contributing to their medicinal properties.[4]Adedapo, AA (2005). Plants have remained the only source of therapy for early man. However with the emergence of

medicinal chemistry the active ingredients of plants were formulated in to pharmaceutical drugs. Today in spite of the availability of numerous pharmaceutical drugs, still traditional medicines, in their crud form are preferred because of their little or no side effect.[5]Sharma, R.A, (2009).The practice of herbal drugs for curing ailment has remained a very successful tradition lagging behind a long history.[6]Rauf,F(2012).Different types of metabolic reactions take place inside the plant body. The metabolic machinery of plants synthesizes various types of chemical compounds. Some of these compounds are of primary importance to the growth and maintenance the plant itself while some other compounds are secondarily produced. Many of the secondary metabolites of plants have potential medicinal values.[7]Ernaz A (2011).

Medicinal plants have a great importance in prehistoric period and since it is used by the local people there for most of the people are engaged in the trade of medicinal plant through out the world.[8]Elisabetsky (1990). Mostly the villagers using plants as medicines as they live away from the cities and mostly there are no proper health facilities that's why knowledge of medicinal plants have been transfer from generation to generation.[9]Shinwari,M,I(2000) World Health Organization (WHO), report show that about 80% of the world's population depends on traditional medicine for its primary health care needs.[10]Ullah R(2010).Treatment of illness with traditional herbal medicine is moving ahead in almost all the countries of the world. In Indo-Pak. Subcontinent, these traditional systems of medicines are known as unani or ayurvedic system.[11] Malik HMA(2001).

Pakistan is God gifted with a distinctive biodiversity and ecology. Flora of Pakistan is bestowed with medicinal plants and up till now a huge data of medicinal plants is explored but some areas are still not explores which needs to documentation and preservation as reported by[12] Mahmood, A (2011). In Pakistan, about 6000 species are identified but only 600 plant species are documented for medicinal uses.[13]Ali,SI(2008). Many researchers explore the flora of different areas of Pakistan like, [14]Shinwari, M.I (2000).Explore Margalla Hills National Park, [15]Shah, S.A (2001). Reported medicinal plants of Ayubia National Park, similarly [16]Qureshi and Khan (2001) reported from Kahuta Rawalpindi, [17]Ali and Qaisar (2009) from Chitral and [18]Sher and Hussain (2009) investigated from Mallam jabba valley, Swat.

As it is mentioned above that a lot of medicinal plants data is explored from many areas of Pakistan but there are still some areas which are not yet documented and out of these areas the investigated area is still not documented. There for the exploration and documentation need was felt to secure the ethnomedicinal date of investigated area before the information lost. The present study was aimed to preserve the traditional knowledge of local uses of medicinal plants of this area for future reference.

MATERIALS AND METHODS

Field Work

Several field trips were practiced to document the ethno botanical knowledge and dependency of the dwellers of the district Karak upon the wild flora. The field work was based on collection, identification, preservation of plant and interviews about their ethno botanical significance.

Observation and Photography

Plants were properly observed during the trips. Parts of the plants including root, stem, leaves and flower were carefully observed for their correct identification and data collection. Photographs of the plants were taken with digital camera.

Collection of Plants

The plants were collected by cutting them carefully with the help of plants cutter. The plants with flowers, fruits and healthy vegetative foliage were preferably selected for collection.

Identification

The plants were identified by compared with flora of Pakistan however the correct identification of plants was confirmed from taxonomist. The local names and the ethobotanical uses of the plants were asked from the local people.

Preservation

Plants were collected and each plant was placed and pressed between two dry paper sheets, dried, preserved. Preservative like naphthalene was added to prevent the plant from insects and fungal attack. After drying the plants were pasted on herbarium sheets.

Interviews
The effort was extended across seasons to explore knowledge about maximum plants, sprouting in different seasons. Knowledgeable persons, Hakims, Herds men, farmers and women were interviewed through questionnaire. Local names, ethno botanical importance and the way of administration of the plants were asked from the people of the study area.

Data collection
Data was collected during the field trips, all sort of information were recorded in written form using questionnaire. The scientific names of the plants were arranged in alphabetical order.

RESULTS
The study of Ethnobotany is of great importance in the conservation and management of natural resources. The use of plants as folk medicines is still common in many societies. The flora of Union Council Ahmad Abad, District Karak, and Pakistan is very rich in medicinal plants and the people of the study area use the plants as medicine. There for this effort was aimed to document the folk indigenous knowledge of the dweller of Union Council Ahmad Abad, District Karak, and Pakistan. Out of the total 170 informants interviewed, the formers, shepherds and old age people of the study area were more knowledgeable as compared to the educated and younger one. In the study area about 43 taxa were recorded having ethnomedicinal uses, which belong to 39 genera and 24 families (Fig 1). The dominant specie was solanaceae (5 spp) followed by asteraceae and euphorbeaceae (4 spp each) and zygophylaceae (3 spp). Investigation show that 30 plants were medicinal in which 17 plants were applied as a whole, seeds of 13 plants, leaves of 11 plants, fruits of 5 plants, roots and flower of 4 and 3 plants respectively were used medicinally (Fig 2). There are total 43 plants were recorded in which 34 were herbs and 9 were shrubs trees were not recorded (Fig 3). In total 30 medicinal plants 9 were pain killer, 6 were used for treatment of skin disorder and fever, 5 were blood purifier, 4 were used for Constipation, Diuretic and Swelling, 3 for diarrhea and 2 for headache (Fig 4). The climatic data (Humidity, Temperature, and Annual Rainfall) of 2009 and 2010 is given in Table 1 and 2 respectively.

DISCUSSION
If there is life there will be dieses as they both go together and human desire to fallow the most secure and effective way for treatment of ailment. Traditional uses of medicinal plants have great importance in the remote areas where there are no other health care facilities. Medicinal plants are home grown treasure and there for mostly the world population depends on the traditional uses of medicinal plants for early application of ailment. Alternative to synthetic medicines herbal medicines are more popular in the remote areas as the people believed that herbal medicines are safer than synthetic medicines. It is reported that in the last few decades, there is a resurgence of public interest in medicinal plants and their role in the primary health care [19]Haq, I. (1983). The traditional knowledge of medicinal uses of plants is mostly accumulated in the areas where still the use of plants have great importance [20]Diallo, D. (1999).
The present study show that the people of study area mostly depend on indigenous plants for treatment of illness and to obtain their essential necessities like fodder, fruits, vegetables, fuel, furniture, shelter and roof thatching. Because the people of the study area are poor there for mostly depend economically on plants. The study area is quite rich with medicinal flora but unfortunately there is no proper system for the conservation and protection of these medicinally important plants to ensure their sustainable use. All the medicinal plants collected during this study were growing wild. Information about the medicinal importance of these plants needs to be documented and the medicinal values of less known plants of the area should be explored as reported by [21]Qureshi et al.(2001) during their ethno botanical survey of Kahuta, Rawalpindi, Pakistan.
The present study show that most of the plants investigated were herbs (Fig 3) there for majority of the plants used as a whole (Fig 2) for treatment of different ailment. The study elucidate that majority of the plants used as a pain killer like, *Aerva tomentosa, Anagalis arvensis, Citrullus colocynthis, Plantago lanceolata, Rananculus muricatus* and *Sisymbrium irio*. Many plants are also used as blood purifier, fever and for treatment of skin dieses. Study also indicates that some plants used for many purposes like *Amaranthus viridus* used as a medicine, fodder and vegetable, *Avena sativa* used as a tonic, medicine, fodder and seeds are used as a food. Mostly the old people of the study area depend on herbal medicines as they believed that natural medicines are harmless. The flora of the study area is at high risk of thread and there is no protective program operating. The grazing and the browsing is the main cause of disruption and can destroy almost all the seedlings. Another thread to the medicinal plants is the poverty the inhabitants of the study area are mostly poor and depend on plants to get money. They are mostly unaware of the

wealth of plants and they uprooted the plants during collection which badly affect the vegetation. The study show that most of the plants of the study area herbs which is highly in thread due to herbicides application of the farmers to remove herbs from the field. In the area of investigation there is no proper source of fuel and the people use plants as alternate source of fuel while cutting it unwisely due to which fuel species and its knowledge decreasing in the study area. This report supported the finding of [22]Barkat et al(2009).

During the interview it was noticed that the traditional knowledge about medicinal plants is becoming restricted to Hakims and old people as the younger people mostly using synthetic medicines against ailment. That's why the knowledge about medicinal plants decreasing in the study area, as it is also reported by [23]Shinwari, Z.K (2010) that herbal medicines are decreasing day by day. There for it was felt necessary to document and preserve the traditional medicinal knowledge of flora of Union Council Ahmad Abad, District Karak, and Pakistan.

Table1. Climatic data of the year 2009

Month	Temperature (°C) Mean maximum	Mean minimum	Humidity (%) Mean maximum	Mean minimum	Rain fall (mm)
January	20	6.8	80	39	0.4
February	22	8	80	36	18.8
March	26	12	78	41	41
April	31	18	77	40	96
May	38	22	77	47	53
June	39	23	57	32	54
July	38.6	26	84	46.8	98.6
August	37	26	81	45	107.8
September	36	23	79	36	28
October	32.6	17.2	61.6	30.2	58
November	26.2	10.6	69.9	38.4	Nil
December	22.7	5.7	70	33	Nil
Mean	30.7	16.5	74.5	38.7	46.3

Table2. Climatic data of the year 2010

Month	Temperature (°C) Mean maximum	Mean minimum	Humidity Mean maximum	Mean minimum	Rain fall (mm)
January	20	4.4	76.30	33.56	19
February	21.2	7.8	81.36	40.73	19.2
March	30	15	82	39	11.5
April	35.96	20.60	68.25	32	20.2
May	38.4	23.8	62	26.6	1.8
June	34.4	27.9	64	40.7	80.5
July	33.5	26.2	82.1	45.77	96.7
August	31.1	26.01	80	43.33	99.33
September	31.33	24.3	76.2	41.2	33.2
October	30	20.3	60	36.4	39.6
November	25.3	12.1	65.4	36.7	22.6
December	20.2	4.5	68	38.3	2.3
Mean	26.69	17.74	72.13	37.85	37.16

Source: Ahmad Wala Agriculture Research Station District Karak

Table#3 Ethnobotanical data of Ahmad Abad District Karak

S/No	Botanical name	Vernacular name	Family name	Habit	Part used	Ethno botanical name
1	*Aerva tomentosa*	Hurh boty	Amaranthaceae	Shrub	Whole plant	Decoction of flowers and leaves are used against joints pain, headache and swellings.
2	*Amaranthus viridus*	Ranzaka	Amaranthaceae	Herb	Leaves	The plant is used as vegetable against constipation, aqueous extract of the roots is used as diuretic.
3	*Anagalis arvensis*	Sheen starga	Primulaceae	Herb	Whole plant	Plant is steeped in water and used as pain killer especially against headache.
4	*Asphodelus tenuifolius*	Piazakai	Liliaceae	Herb	Leaves and seeds	Decoction of the seeds obtained from the plant is used as diuretic, poultice is prepared from the seeds which is externally applied to swellings and inflammation.
5	*Avena sativa*	Jawdhar	Graminae	Herb	Seeds	Seeds are crushed; the flour obtained in this way is filtered and cooked in to meal. The meal is eaten as a laxative used. The seeds can be extracted in water the aqueous extract is used as tonic.
6	*Calligonum polygonoides*	Balamza	Polygonaceae	Shrub	Branches	The aerial fresh and green branches of the plant are crushed; the crushed parts are steeped in water and filtered. The filtrate drunk, it has cooling effect on the body.
7	*Capparis aphylla*	tup/ keerrha	Capparidaceae	Shrub	Fruit and root	Ripened fruits of the plant are eaten for constipation and stomach disorders. The root extract is used in fever.
8	*Carthamus oxyacanths*	Kunzalai	Asteraceae	Shrub	Whole plant	The plant is extracted in water and used as laxative, diaphoretic and also useful in fever and skin diseases.
9	*Chenopodium album*	Harh saba	Chenopodaceae	Herb	Leaves	Aerial parts of the plant are cooked as vegetable to be used as vermifuge and as an aperient.
10	*Chenopodium murale*	Thor sabah	Chenopodiaceae	Herb	Leaves	This plant is also cooked in to vegetable and is eaten as an anthelmintic. It also acts as a

						laxative.
11	*Cleome brachycarpa*	Kastorai	Capparidaceae	Herb	Seeds	Poultice of the plant relieve joints pain, its poultice is also applied to inflammation, aqueous extract of its seeds act as diuretic.
12	*Chrozophor a plicata*	Kharha vangai	Euphorbiaceae	Herb	Whole plant	The plant is squeezed, the juice so obtained is diluted with water and used as blood purifier. The plant also contains blue colored dye which applied to dye fabrics.
13	*Citrullus colocynthis*	Therha manrha/ maraghoni	Cucurbitaceae	Herb	Seeds	Seeds of the plant are taken with water to relieve abdominal pain. Oil obtained from the seeds is applied on the skin acting as emollient.
14	*Convolvulus arvensis*	Prewathiay	Convolvulaceae	Herb	Leaves	Leaves are crushed in to powder which is taken as a tonic to improve memory. Leaves extract act as blood purifier and also applied on skin especially against burning sensation of the skin.
15	*Conyza canadensis*	Malooch	Asteraceae	Herb	Whole plant	Decoction of the plant is used as homeostatic, stimulant. Its decoction is also taken to treat diarrhea and dysentery.
16	*Cynodon dactylon*	Barawa	Gramineae	Herb	Whole plant	The plant is consumed as fodder by the live stock. Decoction of the plant is used for curing rheumatism, diarrhea, dysentery and urenogenital diseases.
17	*Datura alba*	Warha spalmai	Solanaceae	Shrub	Leaves and Seeds	The juice of the plant is warmed with oil and applied on cutaneous infections. Decoction of seeds is used against fever. Poulticed of leaves is applied on swellings of limbs. Leaves extract is drink to treat asthma.
18	*Euphorbia helioscopia*	Mandarhnu	Euphorbiaceae	Herb	Whole plant	The plant is squeezed to get white latex which applied on wounds as an antiseptic.
19	*Euphorbia Prostrata*	Piawara	Euphorbiaceae	Herb	Whole plant	Decoction of the plant is used to remove kidney stones, gall stones or the course deposits of the urinary bladder. Beside this the white latex of the plant is applied on wounds as an antiseptic.

20	*Fagonia critica*	Spelaghzai	Zygophyllaceae	Herb	Whole plant	Aqueous extract of the plants is taken as a drink acting as blood purifier. Its aqueous extract has also cooling effect on the body.
21	*Fumeria parviflora*	Lavanai ghajara	Papaveraceae	Herb	Whole plant	Plant is mixed with vegetables or some time its decoction is taken as a drink for blood purification its powder id some time mixed with piper nigrum to be used against fever. The plant also acts as an anthelmintic.
22	*Heliotropium eichwaldii*	Vangai	Boraginaceae	Herb	Whole plant	Powder of the shade dried plant is applied on wounds. Decoction of the plant is taken to cure hepatic damage.
23	*Lathyrus aphaca*	Zangali mattar	Papilionaceae	Herb	Flowers and Seeds	Tea flowers of the plant are used as resolvent and narcotics, seeds of the plant are directly taken as aphrodisiac.
24	*Launea nodicaulis*	Thareeza	Asteraceae	Herb	Whole plant	Plant is steeped in water to be used as nutritive, purifies the blood act as diuretic and is also used sometime as an antidote. Roots relieve skin disorder. Root and leaves are made in to tea and used against leucorrhoea.
25	*Malva parviflora*	Pathawai	Malvaceae	Herb	Whole plant	Fresh plant is chopped and applied on the swellings and inflammations. Also the dried powder of the plant is applied on wounds.
26	*Oxalis carniculata*	Tarooki	Oxalidaceae	Herb	Leaved and Roots	Leaved and roots of the plant are made in to decoction and used as vermifuge. Also used as an ammenagogue.
27	*Pegenum hermala*	Sponda/ Spelanai	Zygophyllaceae	Herb	Seeds and Fruit	Seeds of the plant are smoked to ward off bad eyes and fruits are used lice killer.
28	*Physalis minima*	Warhuky malghatoon	Solanaceae	Herb	Fruit	The plant especially its fruits are feed to the animals as of great nutritive value. The fruits first crushed an applied with a brush as a tooth past to treat bleeding from the gums.

29	*Plantago lanceolata*	Spenghol	Plantiginaceae	Herb	Seeds	Seeds of the plant are mixed with table sugar, soaked in water for half an hour. This forms a gummy solution. This is used as a drink to relieve heart burn, abdominal pain, and constipation.
30	*Plantagoe ovata*	Spenghol	Plantaginaceae	Herb	Seeds	The seed husks of the plant is taken with water as an antidiarrhoeal, relieve constipation, and is also used to recover the inflamed parts of mucous membrane.
31	*Rananculus muricatus*	Ghat ziarhgulai	Ranunculaceae	Herb	Whole plant	Decoction of the plant is used to treat periodic fever, poultice of fresh plant is applied to the joints to relieve joint pain.
32	*Rhazya stricta*	Gandarai	Apocynaceae	Shrub	Leaves and Root	Extract of Leaves is used as anticancer. Root extract is used for toothache. Leaves are also used as insect repellent.
33	*Ricinus communis*	Arand	Euphorbiaceae	Shrub	Seeds	Oil is obtained by crushing the seeds of the plant. The oil is applied on the skin acting as lubricant and emollient. Seeds extract is fed to the animals as a purgative.
34	*Saccharum aurandinaceum*	Kana	Gramineae	Shrub	Whole plant	Plant is fed to the animals in hot season as a coolant. Its extract has cooling effect when applied against burning sensation of the skin.
35	*Saussurea heteromalla*	Gul boty	Asteraceae	Herb	Leaves, Root and Seeds	Leaves of the plant are crushed and mixed with oil of *Brassica compestris* this mixture is applied to the skin to treat dermal diseases. Roots are extracted in water and taken as a drink to relieve abdominal pain. Seeds of the plant reduce flatulence.
36	*Silene conoidea*	Sur gulai	Caryophyllaceae	Herb	Flower	Extract obtained by crushing the aerial parts of the plant especially the flowers is applied on the skin as an emollient.
37	*Sisymbrium*	Zangali	Brassicaceae	Herb	Seeds and	Seeds are crushed to obtain oil. The oil content

	irio	verai			branches	of the plant is emollient. Extract of branches of the plant is administered as an expectorant. The extract is also used for sour throat and relieves chest pain.
38	*Solanum nigrum*	Warhuky malghatoon	Solanaceae	Herb	Flower and fruit	Fresh fruits (2 to 3) are added to the milk to convert it in to yogurt. Berries and the flowers are prepared in to tea used against cough.
39	*Solanum surattense*	Warha maraghony	Solanaceae	Herb	Whole plant	It is boil in water and then these water given to animals as a pain killer during giving birth.
40	*Tribulus terristris*	Malkonda	Zygophyllaceae	Herb	Whole plant	Aqueous extract of its fruits is used to treat spermatorrhoea and impotency. Whole plant extract is used to relieve cough.
41	*Trigonella foenum*	Shpeshthara	Papilionaceae	Herb	Leaves and seeds	Leaves are cooked as a vegetable eaten with meal as a lubricant to the mucous membranes. Fresh plant extract is taken against diabetes mellitus. Seeds are used as carminative, seeds are also aphrodisiac.
42	*Vitex trifolia*	Vermandai	Lamiaceae	Herb	Leaves	Shade dried leaves of the plant are burnt to deter mosquitoes. Leaves extract is also used to teat fever.
43	*Withania somnifera*	Ghut malghatoon	Solanaceae	Shrub	Fruit	Freshly collected fruits of the plant are extracted in water and taken (2 tea spoons three times daily) as an emetic.

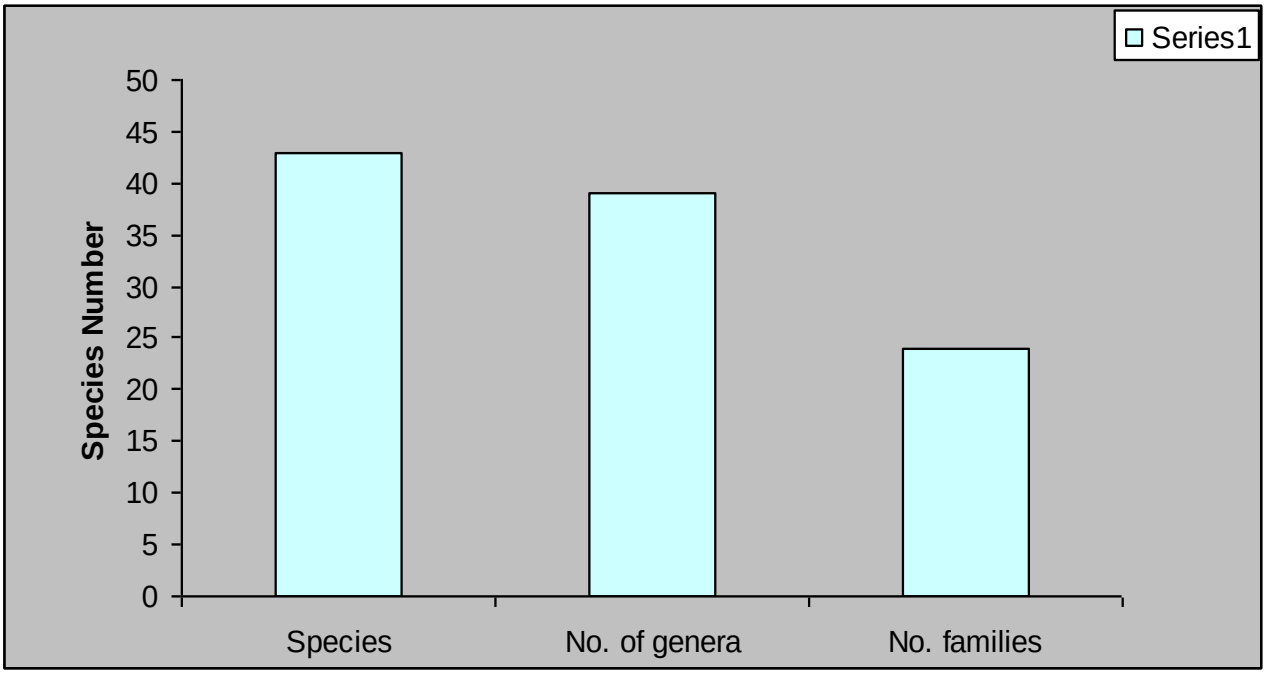

Figure 1: Total number of plant species, genera and families having ethnomedicinal uses.

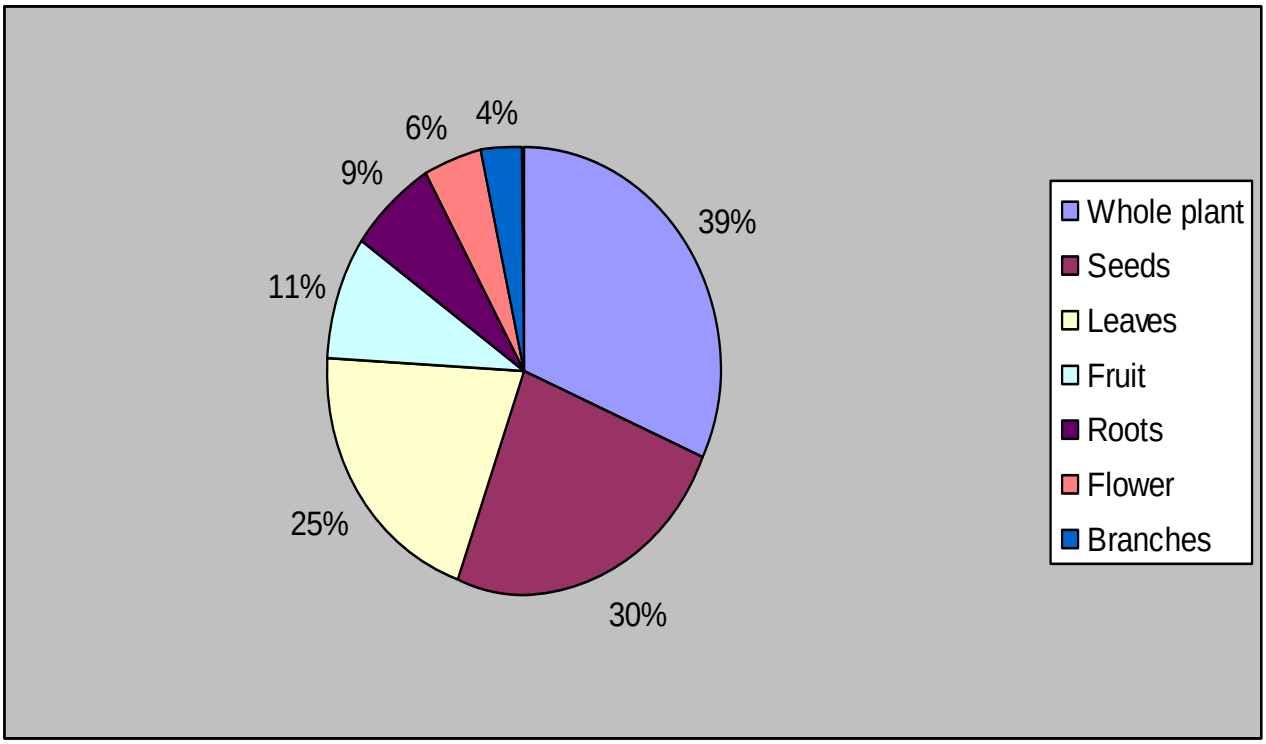

Figure 2: Percentage of plants part used traditionally.

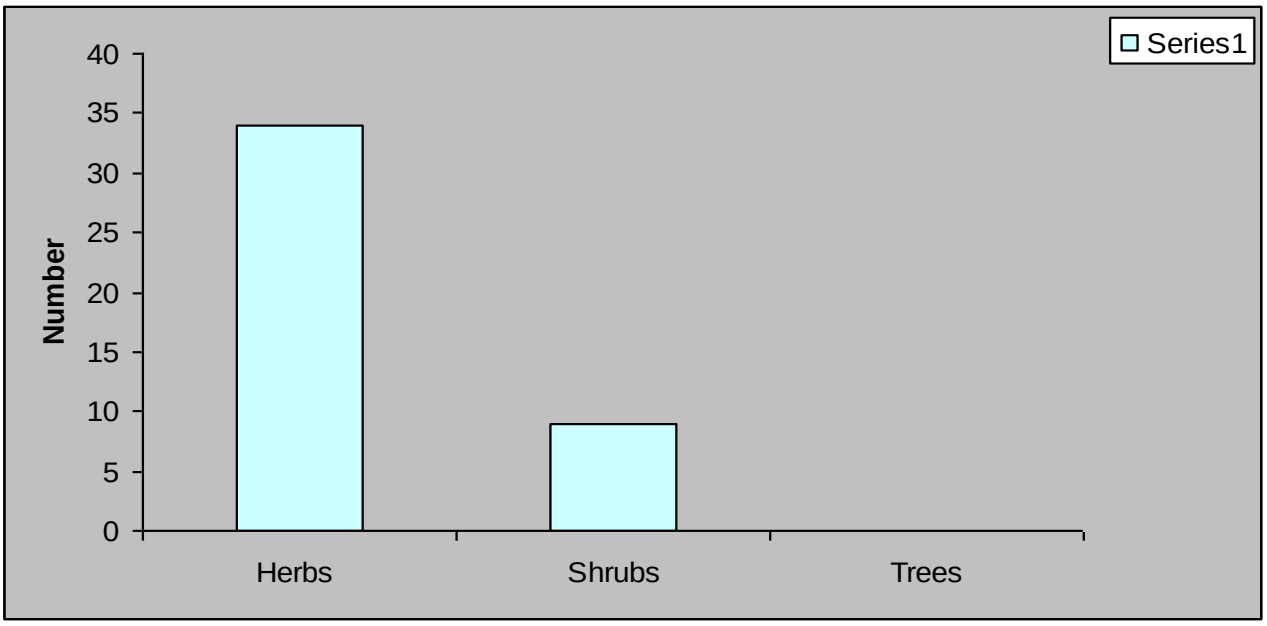

Figure 3: Classification of plants on the basis of their habits.

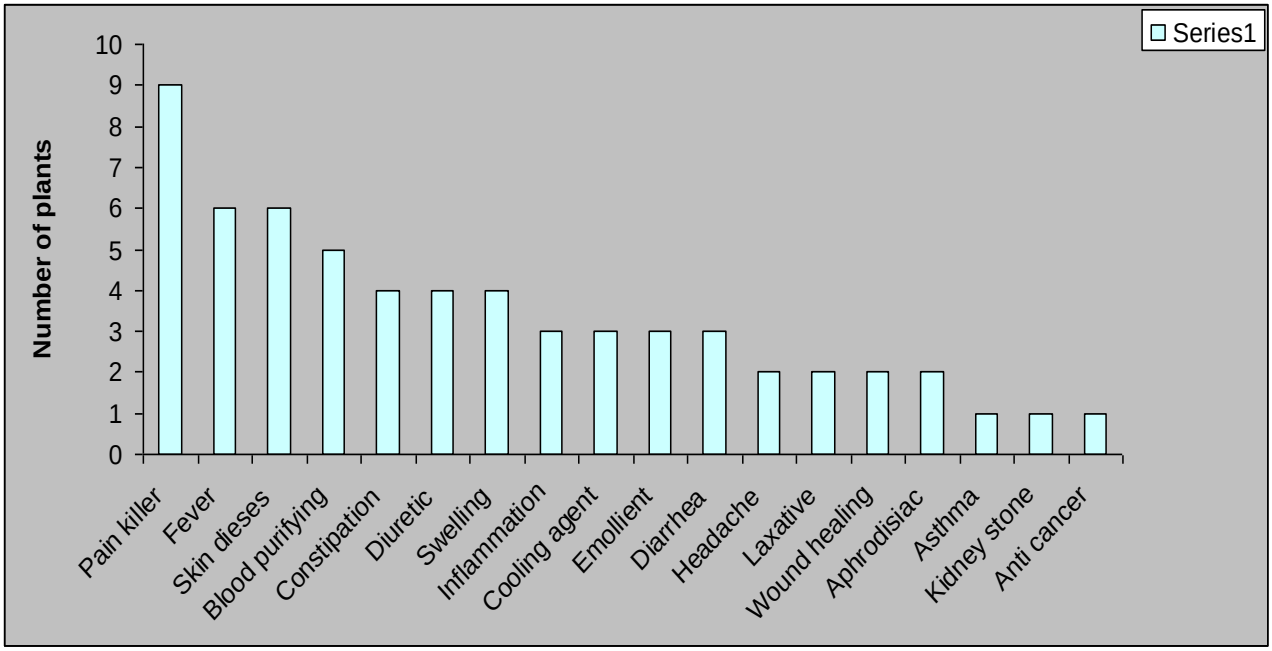

Figure 4: Plants number used for human aliment.

CONCLUSION

The flora of study area is unprotected and the knowledge about it medicinal uses is reducing due to some anthropogenic causes. Over grazing, lack of regeneration, unwisely cutting and collection are the main threads to the flora of the study area. Mostly the people of the study area are poor and they depend on plants for their economical purposes. To overcome these problems it is supposed to educate the local herbal practitioners and the local community to harvest the medicinal plants on sustainable way. It is also essential to train the local people on the proper spreading system in order to promote the domestication of important and threatened medicinal plants.

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