Indus Journal of Social Sciences

Online ISSN: 2960-219X
Print ISSN: 2960-2203
Volume 3, Number 2, 2025, Pages 1010 – 1030
Journal Home Page
https://induspublishers.com/IJSS/about

Ethnomedicinal Uses of Plants in Urak Town of Northern Balochistan, Pakistan

Tahira Bibi[1], Farah Naz Channa[2], Nazima Yousaf Khan[3], Samina Mengal[4] & Niaz Muhammad Tareen[5]

[1]*Department of Botany, Sardar Bahadur Khan Women's University Quetta, Email: tahira_botany@yahoo.com*
[2]*Department of Biotechnology, Sardar Bahadur Khan Women's University Quetta, Email: farah.naz@wu.edu.pk*
[3]*Institute of Biochemistry, University of Balochistan, Quetta, Email: nazimakhan_chem@yahoo.com*
[4]*Govt Girls Degree College Khuzdar, Sardar Bahadur Khan women's University Quetta, Email: saminamengal7@gmail.com*
[5]*Balochistan Text Book Board Quetta, Email: tareenan@yahoo.com*

ARTICLE INFO

Article History:

Received:	*May*	*10, 2025*
Revised:	*May*	*27, 2025*
Accepted:	*June*	*09, 2025*
Available Online:	*June*	*17, 2025*

Keywords:

Medicinal plants, Use values, ethnomedicinal, Balochistan, Hanna Urak, Traditional medicine

Corresponding Author:
Tahira Bibi
Email:
tahira_botany@yahoo.com

ABSTRACT

This first report survey was commenced with an aim to document the use of medicinal plants by the local people in Urak town of Balochistan, Pakistan and its surrounding villages. A survey was performed using face to face conversations with structured open ended and close ended questionnaire and personal observations with 139 informants. The data obtained were quantitatively analyzed using the informant consensus factor (FIC), Family importance value index (FIV), Use report (UR) and use values (UVis). In total of 103 species belonging to 49 families and 100 genera were used by the local inhabitants to treat12 categories of various diseases. The most common plant families as depicted by its number of species (14 species and FIV 49%) was Lamiaceae as the dominant family. The species with greater use values were Eleagnus angustifolia (UVis 0.42), Caralluma tuberculata and Papaver somniferum (UVis 0.24 each). The highest FIC was calculated for antidote category (0.67), while the maximum number of species used to cure gastrointestinal disorders (53 species). The highest prevailing life form was herb (62%), and most remedies were prepared in the form of decoction (40%). The plant parts used commonly were leaves (31%). The medicinal plants with highest use values in the current study thus needs future phytochemical and pharmacological studies to confirm the efficacy and safety aspects of the identified plants. The present study in this region may also supplement the socio economic conditions of the people while taking into account the conservation status of this valuable natural resource.

Introduction

A historical perspective on the use of medicinal plants for the treatment and cure of disease shows that traditional medicinal practices have been associated with humanity since ancient times (Halberstein, 2005). The herbal medicines serve the health needs of about 80% of the world's population, especially for millions of people in the rural areas of developing countries (WHO, 2001). The usage of medicinal plants for primary healthcare needs by millions of people in developing world is still occupying a prominent position (WHO, 2002). Different types of ailments are prevalent in different cultural groups and ethnic communities spread all over the world (Leslie and Young, 1992). Due to the close association with nature and its various components, the tribal and local communities have effectively developed their traditional knowledge system which incorporates the use of locally available plants and its products for treatment of various ailments (Kala, 2005). Thus until the recent past, humans were mainly dependent upon plants for medicine and therapeutics and still about 70% of the world population depends on medicinal plants for their primary healthcare needs (Ghimire et al., 2006) 10-18% of plant species all over the globe are used medicinally (Farnsworth & Soejarto, 1991). About 60% of the world population and 80% of the population of developing countries, 80% in Nepal 70% in India, 80% in Pakistan, 65% in Sri Lanka, 90% in Bangladesh, 85% in Burma, and 60% in Indonesia rely on traditional medicine (Shinwari et al., 2000; Farnsworth, 1988; Shaheen et al., 2012). However, ethnobotanical knowledge is still vastly under documented (Cámara-Leret et al., 2014a) and cross-cultural studies are limited to few ethnic groups and small geographic regions. Still, these studies have provided evidence for the existence of both localized and widespread traditional knowledge on medicinal use. Notably, they show that the same medicinal plants may be used differently by adjacent communities (Junsongduang et al., 2014), that adjacent communities sometimes select different plant species for the same medicinal use (Shepard, 2004), that communities within a single ethnic group may exhibit both idiosyncratic and widespread ethno- botanical knowledge (Srithi et al., 2012), and that patterns of knowledge sharing may vary geographically (Vandebroek, 2010). Nevertheless, the multi-scale, inter-ethnic geographic comparisons necessary to elucidate the highly important and policy-relevant spatial structure of traditional knowledge sharing patterns are missing (Cámara-Leret et al., 2014b).

Herbal medicines are gaining popularity because they have minor or no side effects if administered properly (Jordan et al., 2010; Rokaya et al., 2014) and also has become recognized worldwide not only of its intrinsic value but also because it has a potential instrumental value to science and conservation(Shaheen et al., 2012)Preserving and enhancing the indigenous plant knowledge is actually rescuing a global heritage (Lambert et al., 1997) and is a recognized tool in search for new drugs and pharmaceuticals sources (Sharma & Mujundar, 2003). Asian civilizations are the most important centers of knowledge with regard to the use of plant resources in medicinal aspects. This knowledge of plants has been transferred from generation to generation through oral communication and personal experiences (Shinwari, 2010). In early 1950 up to 84% of Pakistani population was dependent on indigenous medicines for traditional health practices. During the previous few decades there has been a growing curiosity in the study of remedial plants and their folk usage in various parts of Pakistan. In the recent years numbers of information are documented on the use of plants in indigenous healing system by ethnic people or rural communities around the world and Pakistan is increasing (Rokaya et al., 2010; Vitalini et al., 2013; Ummara et al., 2013; Ahmad et al 2014; Bano et al., 2014; Bibi et al., 2014)

It is noted that herbal medicines is now practiced only in the remote areas (Ibrar et al., 2007) because Indigenous knowledge develops and changes with the passage of time, medicinal plants

and health facilities. (Baloch,et al., 2013) “It is recognized that a major threat to the sustainability of natural resources is the erosion of people’s knowledge, and the basic reason for this erosion is the low value attached to it. The erosion of people’s knowledge associated with natural resources is under greater threat than the erosion of natural resources themselves” (Odora Hoppers, 2002; Dweba & Mearns, 2011)

Balochistan province of Pakistan is blessed with diverse climate, flora and fauna (Khan, 2011). The flora of Balochistan is Persian in character and very much less than Afghanistan: but it is northern enough to contain a violet, a primula, the English hawthorn, an anemone, a gentian and plants of many genera familiar in North-Western Europe (Burkill, 1961).Thus, In the Balochistan province the local communities of different regions have centuries old traditional knowledge practices for the usage of medicinal plants and treatment of various diseases (Bhardwaj & Gakhar, 2005) but very few studies were carried out by some scholars in some regions of the province (Shinwari &Malik,1989; Good man & Ghafoor, 1992; Leporatti & Lattanzi, 1994; Shah et al., 2006; Tareen et al. 2010; Qureshi, 2012; Manzoor,et al., 2013; Bibi et al., 2014). The Urak town is attached to the capital city of the province “Quetta”and currently the ethnobotanical knowledge is disappearing very fast from the study area because of urbanization, having health and other facilities. Due to this, it was felt worthwhile to record the folk knowledge of medicinal plants used by the local people of the area The aim of this study was to document ethnomedicinal uses of plants by local inhabitants of the Urak town and its surrounding villages and analyzed ethnobotnaical information using quantitative indices of information consent factor (FIC), family importance value index (FIV), Use report (UR) and use values (UVis).

Material and methods

Study area: Urak is a town in the Balochistān region of Pakistan. It lies between Latitude (lat): 30°16'24"NLongitude (lon): 67°11'27"E and Elevation (approx.): 2129m. 66°41'40"-67°17'25" East longitudes and 30°01'29"-30°28'25" north latitudes and location is at 690 km (aerial distance) south-west (237degrees bearing) of Pakistan's capital city, Islamabad. (Fig. 1). Quetta city islocated 24.5 km west of Urak. The climate of the district is dry, arid: hot in summers and mild to extreme cold in winter. Snowfall season is mostly in the months of December, January and February. Urak does not have a monsoon of sustained and heavy rainfall as it lies outside of monsoon range. Uraktown is mountainous; the hill ranges are fairly uniform in character consisting of long central ridges from which frequent spurs descend. The water scarcity and the day-by-day depletion of ground water level is a major constraint to both agricultural development as well as the facility of potable drinking water for the living societies. The number of tube wells, installed by the Government and private installations (http:// www.balochistan.gov.pk/DistrictProfile/DDP%20Final%202012/Quetta/Quetta.pdf).

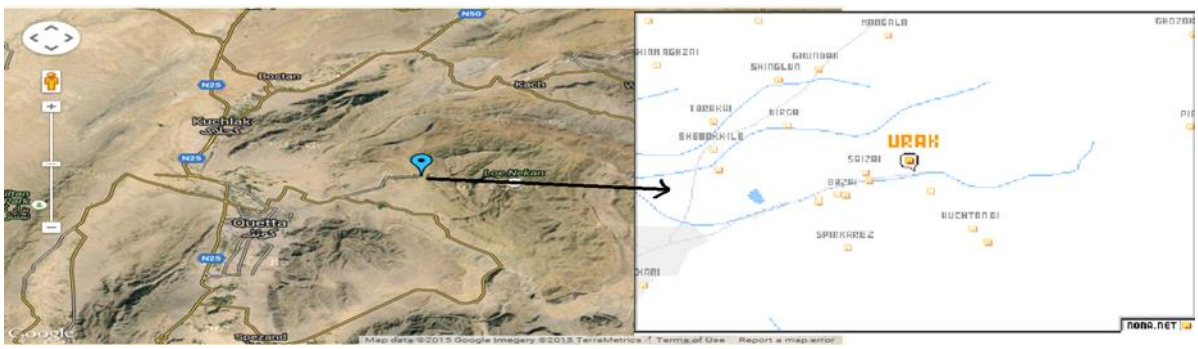

Fig. 1. Map of Urak

Demographic information, data collection and plants identification: Data was collected during March 2014– march 2015 from the Urak and its surroundings i.e. (Tsāhgai (1.9km south east) Sāhibzāda (2.8km west) Saizai (2.8km west) Bāzai(4.5km south west) Atakzai (4.8km west) Wuch Tangi (5.8km south east) Tor Kach (6.0km west) Hanna (6.1km south west) Wālu Zangūn (7.2km south east) Spīn Kārez (7.4km south west) Dirga (8.4km north west) Ghundak (10.2km north west). A total of 139informants were interviewed over the visited area. The demographic physiognomies of the (Informants) were determined and documented (Fig. 2). The informants were interviewed individually through face to face conversations with structured open ended and close ended questionnaire to record the ethnomedicinal information like the medicinal plants used, mode of preparation of medicines, form of usage and dosage. The principal ethnic groups and languages in the study area are mostly Pashtoons butsome Baloch, Brahvi and Punjabi groups are also living in the surrounding villages. The local languages spoken in rural areas were Brahvi and Pashto and Ms. Tahira Bibi and Niaz Muhammad Tareen was aware with the local languages of the study area which permits the accuracy in data recordings. Plants were collected, dried, preserved and processed as per routine herbarium techniques recommended by Jain and Rao (1977). For authentic identification the Flora of Pakistan (Nasir and Ali, 1970–1979; Nasir and Ali, 1980–1989; Ali and Nasir,1989–1991; Ali and Qaiser, 1993– 2007) have been consulted. Voucher specimens were deposited inthe herbariumofDepartmentofPlantSciences Quaid-i-Azam UniversityIslamabad.Botanical names and families were verified using websites of (www. e**flora**s.org/**flora**_page.aspx?**flora**_id=2, http:// www. ipni.org/ andhttp://www. tropicos.org)

Quantitative analysis of data: The data was tabulated and analyzed using four quantitative ethnobotanical indices: Use value (UV), Use reports (UR), family importance value (FIV) and Informant consensus factor (FIC).

Use values (UVs): The UV was obtained by the following formula proposed by (Ritter *et al*., 2012).

$UVis=U_{si}/n$

where U_{si} is the number of uses mentioned by the Informants for the species and n is the number of interviews with the informants. To calculate the use value of each species (UVs), the formula $UVs=\Sigma UV_{is}/n$ was used, where UV_{is} equals the use value of a species for an informant and n is the total number of Informants. The use value (UV) is a quantitative method that demonstrates the relative importance of species and plant family for a population. This index was calculated to establish a relationship between each species and the uses assigned to it by analyzing the index in relation to the use categories.

Informant consensus factor (F_{ic}): To obtain the FIC, the cited species were grouped into thirteen categories of medicinal uses based on the diseases reported by the Informants (Table 3). (Heinrich *etal.*, 1998) The FIC was calculated using the following formula:

$$F_{ic} = \frac{nur-nt}{nur-1}$$

where nur is the number of use reports for particular ailment category, and nt is the number of species used for a particular ailment category by all the informants. FIC is used to test the homogeneity of knowledge on the use of species in the illness categories between the populations. The FIC provides a range of (0–1). High FIC represents that there is a narrow well defined group of species used to cure a particular ailment category and/ or that information is exchanged between

informants and low FIC values (close to zero) indicate that informants disagree over which plant to use due to random choosing or lack of exchange of information about the use among informants (Gazzaneo et al., 2005).

Family importance value (FIV): Family importance value (FIV) gives the local importance of the families of wild species. It was calculated by taking the percentage of informants mentioning the family (Vitalini et al., 2013)

FIV =FC (family)/N×100

Where, Fc is the number of informants mentioning the family while N is the total number of informants participating in the study.

Results and discussion

Use of plants and demography of Informants: A total of 139 informants (130 local people and 09 tradition healers locally known as Hakeems, Pansars or Poopoos) were interviewed from the Urak and its12 surrounding villages i.e. Tsāhgai, Sāhibzāda, Saizai, Bāzai, Atakzai, Wuch Tangi, Tor Kach, Hanna, Wālu Zangūn, Spīn, Kārez Dirga, Ghundak .Thesecomprised(63%)menand(37%) women. Large numbers of informants were in the age group of 41-60 years (46%),followedby above 60 years (31%)and 20–40 (23%)(Fig. 2).

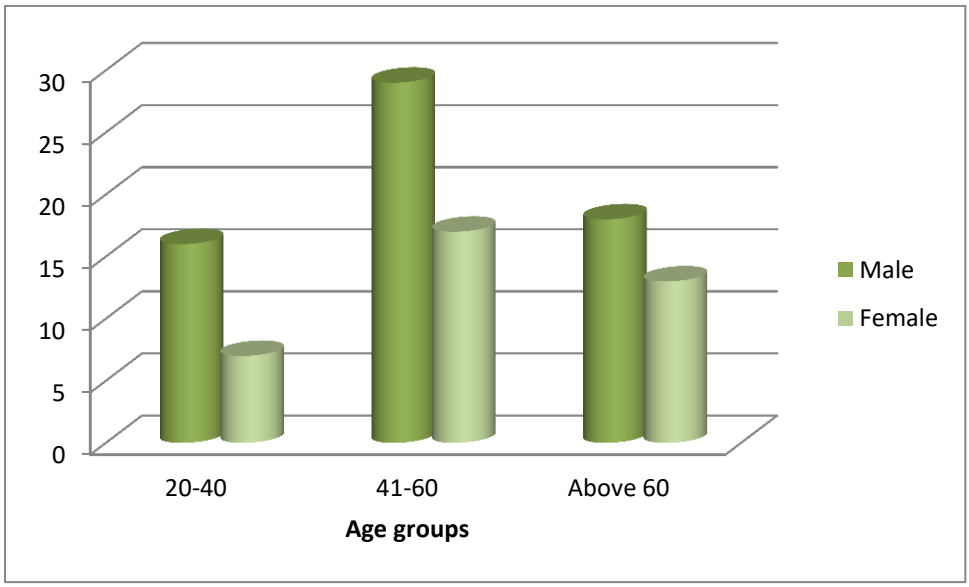

Fig. 2. Distribution of gender, age and number of informants interviewed.

A total of 103 species belonging To 49 families and 100 genera were reported by Informants for medicinal preparations (Table 1). The largest number of medicinal plant species came from Lamiaceae (14 species, followed by Euphorbiaceae (7 species), Amaranthaceae, Apiaceae, Asteraceae and Fabaceae (6species each) (Table 2). The highest FIV was calculated for family Lamiaceae (FIV 49%).The species with greater use values were *Eleagnus angustifolia* (UVis 0.42) *Caralluma tuberculata* and *Papaver somniferum* (UVis 0.24 each)and *Citrus limon* (UVis 0.23)(Table 1). The highest FIC was calculated for antidote category (0.67), while the maximum number of species used to cure gastrointestinal disorders (53 species). The highest prevailing life form was herb (62%), and most remedies were prepared in the form of decoction (40%). The plant

parts used commonly were leaves (31%) and remedies were mostly administered orally (72%).

Table 1: Medicinal uses of plants by the local peolple of Urak, Balochistan, Pakistan, with its use reportsanduse values

Family	Taxonomic name, (Voucher number)	Local name	Life form	Part used	Disease treated	Preparation mode(s)	Oral/ topical	UR	UV_s	UVis
Alliaceae	*Allium cepa* L. (UR.SBK 1)	Piyaz/ Pimaz	Hrb	Bulb	skin boils, pimples	Roasted	Topical	2	7	0.07
	*Allium umbilicatum*Boiss (UR.SBK 2)	Khokhay	Herb	Bulb	Stomach problems, appetizer	Raw leaves, bulb, decoction	Oral	2	3	0.03
Amaranthaceae	*Amaranthus lividus*Roxb. (UR.SBK 3)	Jao sag	Herb	Leaves	Joints pain, to make cool stomach, fairness of skin	Cooked	Topical	3	9	0.09
	*Anabasis setifera*Moq.(UR.SBK 4)		Shrub	Leaves	Diabetes, purgative, heart problems	Powder	Oral	3	4	0.04
	*Ceratocarpus arenarius*L. (UR.SBK 5)	Azghae bootai	Herb	Whole plant	Anti lice, antidandruff	Decoction	Topical	2	3	0.03
	*Chenopodium album*L. (UR.SBK 6)	Saag	Herb	Leaves	Purgative, joints pain, dysentery	Cooked, infusion	Oral	3	5	0.05
	*Salsola nitraria*Pall. (UR.SBK 7)		Herb	Whole plant	Toothache, gums pain	Decoction	Oral	2	3	0.03
	*Suaeda arcuata*Bunge (UR.SBK 8)		Herb	Whole plant	Skin diseases, joints pain	Paste, powder	Oral, topical	2	5	0.05
Anacardiaceae	*Pistacia khinjuk*Stocks (UR.SBK 9)	Shinay	Tree	Gum	Cough, chest problems	Tea, soup	Oral	2	11	0.11
Apiaceae	*Bunium cylindricum*Drude (UR.SBK 10)	Riza /zira	Herb	Seeds	Stomach problems, colic pain, chest infections	Decoction, powder	Oral	3	11	0.12
	*Dorema ammoniacum*D. Don (UR.SBK 11)	Jangli dhaniarh	Herb	Leaves, seeds	Digestion, gastric, menstrual problems	Powder, decoction	Oral	3	6	0.06
	*Foeniculum vulgare*Mill.(UR.SBK 12)	Kuzha oklani	Herb	Seeds	Food for infants, digestion	Infusion, syrup	Oral	2	7	0.07
	Peucedanum kotschyi Boiss. (UR.SBK 13)	Raghbol	Herb	Leaves, seeds	Digestion, gastric, indigestion	Raw leaves, powder	Oral	3	5	0.05
	Trachyspermum ammi(L.) Sprague (UR.SBK 14)	Sparakai/ ajwain	Herb	Seeds	Nausea, cough, digestion, heart burn	Raw seeds, powder	Oral	4	13	0.14
	*Zosima absinthifolia*Link (UR.SBK 15)	Gwatk	Herb	Seeds	Stomach problems, digestion, gastric	Powder	Oral	3	12	0.13

Apocynaceae	*Caralluma tuberculata*N.E. Br. (UR.SBK 16)	Pamune/ Marmoot	Herb	Whole plant	Diabetes, fever, high blood pressure	Powder	Oral	3	23	0.24
Asteraceae	*Achillea millefolium*L.(UR.SBK 17)	Zawal	Herb	Whole plant	Nausea, diarrhea, stomach problems	Decoction, infusion, powder	Oral	3	8	0.08
	Anthemis odontostephana Boiss. (UR.SBK 18)	Zharh gulae	Herb	Whole plant	Diarrhea, contort, dysentery, stomachache	Infusion, powder	Oral	4	8	0.08
	Filago hurdwarica (Wall. ex DC.) Wagenitz (UR.SBK 19)	Lewan bootai	Herb	Whole plant	leucorrhoea, leprosy, white spots of skin	Powder, decoction	Oral, topical	3	3	0.03
	Launaeanudicaulis(L.) Hook.f. (UR.SBK 20)	Adang	Herb	Whole plant	Jaundice, diuretic, vermifuge, Removes itching and white spots of skin.	Paste, decoction	Oral, topical	5	12	0.13
	Seriphidium quettense(Podl.) Y.R. Ling (UR.SBK 21)	Tarkha /Jir	Shrub	Leaves	Vomiting, stomach problems, diarrhea, blood purifier	Powder	Oral	4	18	0.19
	Acroptilon repens(L.) DC. (UR.SBK 22)	Talkha	Herb	Whole plant	Vermifuge, constipation, stomach problems	Infusion. powder	Oral, topical	3	9	0.09
Berberidaceae	*Berberis baluchistanica* Ahrendt (UR.SBK 23)	Zarlag	Shrub	Fruit	Remove cysts from ovary, painful menses	Decoction	Oral	2	8	0.08
	*Leontice ewersmanni*Bunge (UR.SBK 24)	Ghantai	Herb	Tubers	food for under weights/skinny persons	Cooked	Oral	1	4	0.04
Boraginaceae	*Arnebia decumbens*(Vent.) Coss. & Kralik (UR.SBK 25)	Washta bootai	Herb	Whole plant	Anti fertility, abortion, boils,	Paste, powder	Oral, topical	3	4	0.04
	Gastrocotyle hispida(Forssk.) Bunge (UR.SBK 26)		Herb	Whole plant	Gonorrhea, pneumonia	Decoction	Oral	2	2	0.02
	*Onosma hispida*Wall. ex G. Don (UR.SBK 27)	Arrilang	Herb	Whole plant	Wounds/ ulcers	Powder with oil as ointment	Topical	1	5	0.05
Brassicaceae	*Cardaria chalepensis*(L.) Hand.-Mazz.(UR.SBK 28)	Mergash/ obasht	Herb	Leaves	Dandruff, itching of body, skin diseases, joints pain	Paste, cooked, decoction	Oral, topical	3	9	0.09
	*Crambe cordifolia*subsp.*kotschyana*(Boiss.) Jafri	Pishai/ Pushai	Herb	Leaves	Blood purifier, Itching of body	decoction	Oral	2	3	0.03

	(UR.SBK 29)									
	Descurainia sophia(L.) Webb ex Prantl (UR.SBK 30)	Khaksheer	Herb	Seeds	Stomach cooling, thirst quencher	Syrup	Oral	2	7	0.07
Caryophyllaceae	*Acanthophyllum honigbergeri*(Boiss.) Barkoudah (UR.SBK 31)	Kitamura	Herb	Whole plant	Eczema, itching of body	Decoction	Topical	2	4	0.04
	*Gypsophila alsinoides*Bunge (UR.SBK 32)		Herb	Whole plant	Blood purifier, piles, jaundice,	Decoction	Oral	3	2	0.02
	*Silene brahuica*Boiss. (UR.SBK 33)	Gardi	Herb	Whole plant	Piles, vermifuge	Decoction	Oral	2	6	0.06
Chenopodiaceae	*Haloxylon griffithii* subsp. *griffithii* (Moq.) Boiss. (UR.SBK 34)	Bundi	Shrub	Whole plant	Diabetes, digestion	Decoction, powder	Oral	2	2	0.02
Cucurbitaceae	*Momordica charantia*L. (UR.SBK 35)	Karelay	Herb	Fruit	Painful menses, blood, purifier, fairness of skin, stomachache, diabetes	Powder, decoction, cooked	Oral	5	12	0.13
Cupressaceae	*Juniperus excels*M. Bieb. (UR.SBK 36)	Juniper/ Apurhs	Shrub	Leaves	Mouth wash for toothache, cough	Decoction	Oral, topical	2	9	0.09
Cyperaceae	*Schoenus nigricans*L. (UR.SBK 37)	Bootae	Herb	Whole plant	Hiccups, backache	Decoction	Oral	2	2	0.02
Elaeagnaceae	*Eleagnus angustifolia* L. (UR.SBK 38)	Sinjit/sundathi	Tree	Fruit	Diarrhea	Raw dried fruits	Oral	1	4	0.42
Ephedraceae	*Ephedra gerardiana*Wall. ex C.A. Mey. (UR.SBK 39)	Oman	Shrub	Whole plant	Cough, flue, cold, whooping cough, asthma	Decoction, powder	Oral	5	15	0.15
Euphorbiaceae	*Euphorbia osyridea*Boiss. (UR.SBK 40)	Poi booti	Herb	Latex	Insect bite, scorpion sting	Latex	Topical	2	3	0.03
	*Ricinus communis*L. (UR.SBK 41)	Murghpad/ bedanjeer	Shrub	Leaves, Seeds	Muscular pain, joints pains, pimples, wounds, skin boils, constipation	Raw form, paste, oil	Topical	6	13	0.14
Fabaceae	*Alhagi maurorum*Medik. (UR.SBK 42)	Zoz	Shrub	Whole plant	Purgative, diuretic, kidney stones,	Decoction	Oral	3	4	0.04
	*Astragalus stocksii*Benth. ex Bunge (UR.SBK 43)	Shinalo	Shrub	Whole plant	Fever, headache, measles, whooping cough	Decoction, infusion	Oral	4	5	0.05
	*Caragana ambigua*Stocks (UR.SBK 44)	Makhi	Shrub	Whole plant, fruit	Menstrual problems, kidney pain	Decoction	Oral	2	7	0.07
	*Cassia fistula*L. (UR.SBK 45)	Zanghawarh	Tree	Fruit	Burns, fever, cough, vermifuge, purgative	Decoction, powder	Oral/ topical	5	12	0.13

	*Onobrychis tavernierifolia*Stocks ex Boiss. (UR.SBK 46)	Saisubai	Herb	Whole plant	Healthy hair, long hair	decoction	Topical	2	2	0.02
	*Sophora mollis*subsp.*griffithii*(Stocks) Ali (UR.SBK 47)	Ghureza	Shrub	Leaves	Anti lice, long hair, healthy hair	Decoction	Oral	3	7	0.07
	*Trigonella gharuensis*Rech. f. (UR.SBK 48)	Ghara methi	Herb	Leaves	Gastric, joints pain, diabetes	Decoction	Oral	3	8	0.08
Fumariaceae	*Fumaria indica* (Hausskn.) Pugsley (UR.SBK 49)	Shook sag	Herb	Whole plant	Blood purifier, menstrual problems	Decoction	Oral	2	4	0.04
Gentianaceae	*Gentianodes olivieri*(Griseb.) Omer, Ali & Qaiser (UR.SBK 50)	Bhangera	Herb	Whole flower	Fever, stomachache, headache	Decoction	Oral	3	8	0.08
Geraniaceae	*Geranium rotundifolium*L. (UR.SBK 51)	Juraeban	Herb	Leaves	Remove marks from skin, wounds healing	Paste	Topical	2	6	0.06
Ixioliriaceae	*Ixiolirion tataricum*(Pall.) Schult. & Schult. f. (UR.SBK 52)	Khokhae	Herb	Leaves, bulbs	Coilc pain, digestion	Decoction, raw bulbs	Oral	2	2	0.02
Juglandaceae	*Juglans regia*L. (UR.SBK 53)	Akhrot	Tree	Leaves, fruit coat	Miswak, to clean the teeth	Raw Leaves, fruit coat	Topical	1	18	0.19
Juncaceae	*Juncus inflexus*L. (UR.SBK 54)	Obba bootai	Herb	Whole plant	Muscle stretch, joints pain	Powder	Topical	2	4	0.04
Lamiaceae	*Lallemantia royleana*(Benth.) Benth. (UR.SBK 55)	Ghara podina	Herb	Whole plant	Cough, dysentery, contort, diarrhea	Infusion, decoction	Oral	4	14	0.15
	*Lamium amplexicaule*L. (UR.SBK 56)	Shin podina	Herb	Whole plant	Stomach problems, vomiting, gastric, cough, nausea	Decoction, powder	Oral	5	5	0.05
	*Marrubium anisodon*C. Koch (UR.SBK 58)	Char gulai	Herb	Leaves	Skin diseases, eczema, diabetes, high blood pressure, fever	Decoction, paste	Oral, topical	5	6	0.06
	Mentha longifolia L. (UR.SBK 59)	Podina	Herb	Leaves	Fairness of face, cooling of stomach, gastric problems, gums,	Infusion	Oral	4	19	0.2
	Menthaspicata Crantz (UR.SBK 60)	Podina, shimshobai	Herb	Leaves	Vomiting, diarrhea, gastric	Infusion, decoction	Oral	3	14	0.15
	*Nepeta praetervisa*Rech. f.(UR.SBK 61)	Simshok	Herb	Whole plant	Cold, cough, flue, chest infections	decoction	Oral	4	16	0.17
	*Perovskia abrotanoides*K	Yirk	Shrub	Leaves	Vomiting, diarrhea	Decoction,	Oral	2	9	0.09

	ar. (UR.SBK 62)					infusion				
	*Salvia bucharica*Popov (UR.SBK 63)	Sarsand	Herb	Leaves, flower	Fever, cough, diarrhea	Decoction, infusion	Oral	3	7	0.07
	*Salvia cabulica*Benth. (UR.SBK 64)	Matetav	Shrub	Leaves	Stomach cooling, thirst quencher	Infusion	Oral	2	4	0.04
	*Teucrium stocksianum*var .*patulum*Hedge & Lamond (UR.SBK 65)	Kalpora	Herb	Leaves, whole plant	Jaundice, fever, chest problems, stomachache	Powder, decoction	Oral	4	20	0.21
	Thymus linearis subsp. *Hedgei* Jalas (UR.SBK 57)		Herb	Leaves	Whooping cough, stimulant	Decoction	Oral	2	3	0.03
	*Vitex agnus-castus*L. (UR.SBK 66)	Gung	Tree	Seeds	Stomach problems, cough	Paste with honey	Oral	2	4	0.04
	*Zataria multiflora*Boiss. (UR.SBK 67)	Izghand	Shrub	Leaves	Colic pain, stomach problems, cough	Powder, tea	Oral	3	6	0.06
	*Ziziphora tenuior*L. (UR.SBK 68)	Maurai	Herb	Whole plant	Dysentery, contort, diarrhea, vomiting	Infusion	Oral	4	18	0.19
Liliaceae	*Tulipa lehmanniana*Merckl. (UR.SBK 69)		Herb	Bulb	Gastric, purgative	Raw bulbs	Oral	2	4	0.04
Lythraceae	*Punica granatum*L. (UR.SBK 70)	Anardana	Tree	seed	Dysentery, contort	powder	Oral	2	17	0.18
Malvaceae	*Malva neglecta*Wallr. (UR.SBK 71)	Pochko/ harn khori	Herb	Leaves	Blood purifier, skin fairness, stomach problems	Decoction	Oral	3	8	0.08
Meliaceae	*Melia azedarach*L. (UR.SBK 72)		Tree	Fruit	Anti lice, eczema, boils, antidote	Decoction	Topical	4	8	0.08
Menispermaceae	*Cocculus pendulus*(J.R. Forst. & G. Forst.) Diels (UR.SBK 73)	Zamur	Shrub	Mucilage	Chest in.fections of infants, soften breasts, eye infections	Fresh mucilage, Decoction	Oral, topical	3	10	0.11
Moraceae	*Ficus carica*L. (UR.SBK 74)	Inzar	Tree	Fruit	Purgative, digestion, cough	Raw fruit, decoction	Oral	3	11	0.12
	*Morus alba*L. (UR.SBK 75)	Toot	Tree	Fruit	Purgative, cough	Infusion	Oral	2	4	0.04
Papaveraceae	*Papaver somniferum*L. (UR.SBK 76)	Koknar	Herb	Fruit, seeds	Cough, flue cold, chest infections, to make sleep the babies	Decoction	Oral	5	23	0.24
	*Roemeria hybrida*subsp.*dodecandra*Maire (UR.SBK 77)	Kohe koknar	Herb	Fruit, seeds	Cough, to make sleep babies, chest infections	Decoction	Oral	2	7	0.07
Pinaceae	*Pinus roxburghii*Sarg .(UR.SBK 78)		Tree	Seeds	Wounds, earache	Oil	Topical	2	3	0.03
Plantaginaceae	*Plantago major*L.	Bartang	Herb	Seeds	Cough, chest problems	Decoction	Oral	2	9	0.09

	(UR.SBK 79)									
	*Veronica biloba*L. (UR.SBK 80)	Shin gul/ jaza	Herb	Leaves	Earache	Paste	Topical	1	1	0.01
Plumbaginaceae	*Acantholimon stocksii*Boiss. (UR.SBK 81)	Nezay wala gul	Shrub	Whole plant	Cardiac disorders, high blood pressure	Decoction, powder	Oral	2	5	0.05
Poaceae	*Hordeum bogdanii*Wilensky (UR.SBK 82)	Shinaze	Herb	Spikes	Abortion, painful menses	decoction	Oral	2	4	0.04
Polygonaceae	*Atraphaxis spinosa*L. (UR.SBK 83)	Karwan kush	Shrub	Flowers	Kidney pain, diuretic	Decoction	Oral	2	5	0.05
	*Rumex chalepensis*Mill. (UR.SBK 84)	Thurosh ko	Herb	Leaves	Backache, joints pain, cough	Cooked	Oral	3	6	0.06
Potamogetonaceae	*Potamogeton pectinatus*L (UR.SBK 85)	Naghurkhal/ izbotk	Herb	Whole plant	Cough, flue, cold	Decoction	Oral	3	8	0.08
Ranunculaceae	*Anemone biflora*DC. (UR.SBK 86)		Herb	Whole plant, leaves	Sore throat, wounds, collic pain	Paste, decoction	Oral, topical	3	3	0.03
Rosaceae	*Amygdalus brahuica*Boiss. (UR.SBK 87)	Kunduri/ Mazhmonk	Shrub	Gum	Constipation, postpartum pains, eye diseases	Decoction, raw gum	Oral, topical	3	6	0.06
	*Rosa indica*L. (UR.SBK 88)	Gulgulap / arq gulap	Shrub	Petals	Skin fairness/ bright skin, constipation, eye diseases	Extract, paste	Topical	3	21	0.22
Rubiaceae	*Callipeltis cucullaris*Rothm. (UR.SBK 89)		Herb	Whole plant	Cholera, dysentery, stomach disorders.	Infusion, powder	Oral	3	4	0.04
	*Jaubertia aucheri*Guill. (UR.SBK 90)	Tusuko	Shrub	Whole plant	Fever, headache, dysentery	Decoction	Oral	3	7	0.07
Rutaceae	*Citrus limon* L. (UR.SBK 91)	Lembo/ lemboo	Tree	Fruit	Dysentery, low blood pressure, cooling of body, malarial fever, thirst quencher	Infusion, juice, syrup	Oral	5	22	0.23
	Haplophyllum acutifolium(DC.) G. Don (UR.SBK 92)	Gandarem	Herb	Whole plant	Fever, anti lice	Decoction	Oral , topical	2	3	0.03
Salicaceae	*Populus nigra*L.(UR.SBK 93)	Zagha/ jag	Tree	Leaves	Skin boils, pimples	Paste	Topical	2	5	0.05
	*Salix excels*S.G. Gmel. (UR.SBK 94)	Talai	Tree	Leaves, bark	Hepatitis, diabetes	decoction	Oral	2	5	0.05
Santalaceae	*Santalum album*L. (UR.SBK 95)	Chandan	Tree	Stem	Muscular pain, face fairness	Powder	Topical	2	3	0.03
Solanaceae	*Hyoscyamus squarrosus*Griff. (UR.SBK 96)	Ghara bhang	Herb	leaves	Skin tumors	Powder	Topical	1	2	0.02
	*Solanum nigrum*L.(UR.SBK 97)	Tor angoor	Herb	Fruits	Cough, chest problems, jaundice	Decoction	Oral	3	10	0.11

	Withania coagulans(Stocks) Dunal (UR.SBK 98)	Panirband	Shrub	Fruits	Diabetes, cough, blood purifier	Powder, decoction	Oral	3	13	0.14
Tamaricaceae	*Tamarix baluchistanica* Qaiser (UR.SBK 99)	Ghaz	Shrub	Leaves, bark	Gastric, diarrhea, jaundice	Decoction, powder	Oral	3	8	0.08
Vitaceae	*Vitis vinifera*L. (UR.SBK 100)	Angoor	Shrub	Leaves	Muscular pain, muscle stretch, skin boils, lumps	Warm raw leaves	Topical	4	14	0.15
Zingiberaceae	*Zingiber officinale*Roscoe (UR.SBK 101)	Adrak	Herb	Rhizome	Dry cough, Menstrual problems, chest infections	Decoction, powder, tea	Oral	3	13	0.14
Zygophyllaceae	*Tribulus terrestris*L.(UR.SBK 102)	Gurgunduk	herb	Whole plant	Diuretic, kidneys pain, kidney stones	Decoction	Oral	3	10	0.11
	*Zygophyllum eurypterum*Boiss. & Buhse(UR.SBK 103)	Kraich	Shrub	Flower	Cough, toothache	Decoction, raw flowers	Oral	2	4	0.04

Table 2: Most numerously represented families.

Family name	Number of taxa
Lamiaceae	14
Asteraceae	6
Fabaceae	6
Apiaceae	6
Amaranthaceae	6
Euphorbiaceae	7
Brassicaceae	3
Caryophyllaceae	3

It is noted that mostly the Informants were male in the area, some of these male Informants are locally known as Hakim and Pansars. The local people visits them, share their problems and ask remedies for the cure of their diseases. The results of this study showed that Lamiaceae is the largest medicinal plant family used by Informants (Table 2). Ahmad *et al*., (2014) also reported the family Lamiaceae as dominant family during the Ethnobotanical study of Medicinal Plants in high mountainous region of Chail valley (District Swat, Pakistan). The wide distribution of the species in the area may be the reason of predominance of the family. Almost all the plants used by local informants occur in the Urak town or district Quetta, but only three plant species are purchased from other parts of province or country and used for the cure of different diseases i.e. *Santalum albumWithania coagulans* and *Zingiber officinale.Withania coagulans* occurs in warm districts of Balochistan like Khuzdar, Loralai and this plant doesn't occur in Study area, but I am observing a single plant in the district Quetta on the Lakpass hill from last three years which is producing seeds and in a good condition.

Plant parts used, life form, preparations and mode of administration: Almost all plant parts were used to prepare different medicinal formulations: Whole plant roots/ rhizomes/ bulbs/ tubers/ fruits/ seeds/ leaves/ stem/ bark, flowers/ gum/ latex/ milk, but the most frequently used plant parts were the leaves (31%) followed by (whole plant 30%) fruits (12%) and seeds (11%) (Fig. 3).

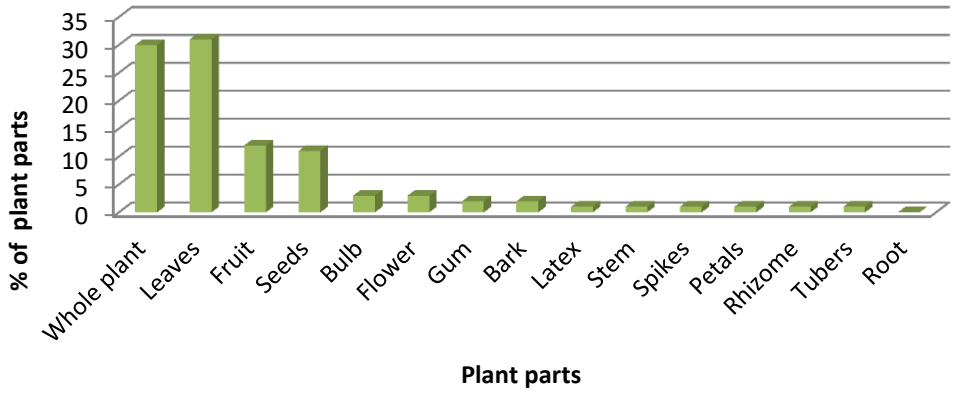

Fig. 3. Percentage of plant parts used.

Number of workers all around the world have been reported the use of leaves in their work e.g. (Bennett and Prance, 2000; Neves *et al*.,2009; Mahishi *et al*., 2005; Ignacimuthu *et al*., 2006, 2008; Srithi *et al*., 2009; Cakilcioglu &Turkoglu, 2010; Giday *et al*., 2010; Gonzalez *et al*., 2010, Kiyani *et al*., 2014) The object why leaves were used mostly is that they are gathered very effort Lesley than underground parts, flowers and fruits etc.(Giday *et al*., 2009) or that the leaves are more accessible or available in nature and are relatively more abundant as compared to other plant parts which may explain why they are used and in logical point of view leaves are vigorous in photosynthesis and production of metabolites (Ghorbani, 2005), while the frequent use of whole plant in the region may be that the area is mountainous and very less rainfalls in the region, mostly plants are herbaceous and wild bushes due to this the people collect the aerial parts of plants and use their decoction and infusion commonly(Bibi *et al*., 2014, 2015). It is noted that no any use of roots is reported in our area, probably due to their low level of approach that the roots of shrubs and trees are very difficult to get from the hard surface of the study area.

Herbs were the primary source of medicine (62%) followed by shrubs (23%) and trees (15%) (Fig.4). The herbaceous habit is not only dominant life form in our study but it is a common and wide spread ecological phenomenon around the world (Ibrar *et al*., 2007; Jan *et al*., 2011). Similarly Kiyani *et al*., (2014) also reported that the herbaceous plants as dominant habit are consummed in the Abbotabad of Pakistan. Bibi *et al*., (2014) reported the similar results in the area of District Mastung Balochistan of Pakistan. The frequent use of herbs among the indigenous communities is due to the rich wealth of herbaceous plants in their environments (Ayyanar &Ignacimuthu, 2005; Uniyal *et al*., 2006).

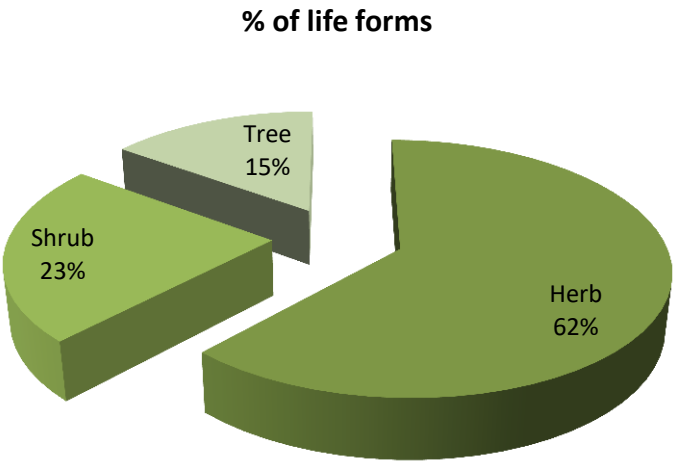

Fig. 4. Percentage of plant life forms.

Decoction was the most frequently used preparation technique (40%), followed by powder (20%) and infusion (11%) (Fig. 5). The medicinal plant preparations were administered to the people through different routes including oral and topical. Oral (72%) was the most commonly used route of administration, which was followed by topical (28%) (Fig. 6), most medicinal formulations were consumed orally, often with water and sometimes with milk and honey (Chander *et al*., 2014; Nasab & Khosravi, 2014). It was also reported that fresh leaves of some species, such as *Vitis vinifera*, *Ricinus communis*were warmed and wrapped on tumors, boils to remove the pus or tied on joints or muscles for aches.

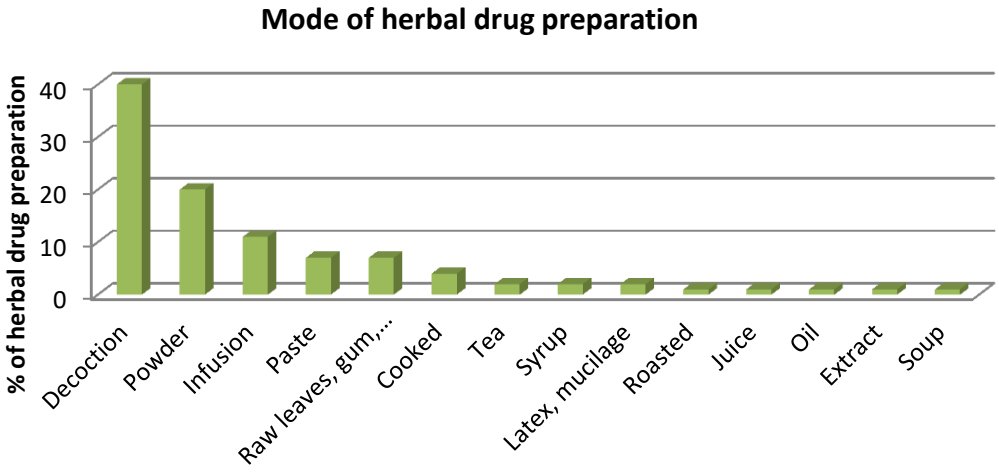

Fig. 5. Percentage of herbal drug preparation

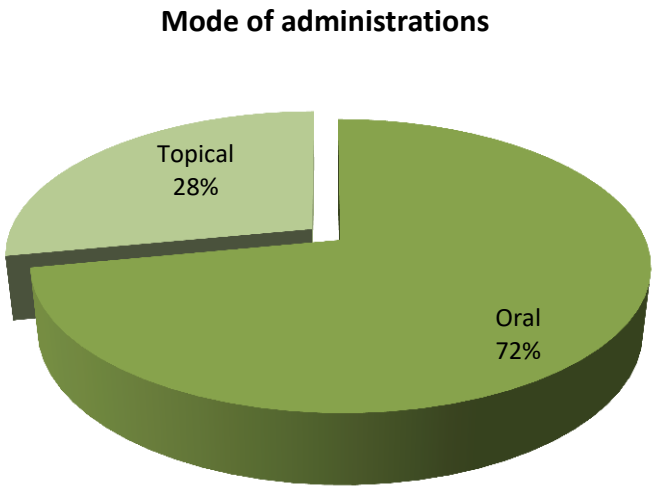

Fig. 6. Percentage of mode of administration.

Mode of use and use categories: Local Informants believe that using plant mixtures in the preparation of a medicine is important as a single plant alone may not be sufficient to cure any disease completely, whereas the combination of several medicinal plants increases the quality and efficacy of medicine. Similar observations have also been recorded by (Ayyanar & Ignacimuthu, 2005; Chander *et al*., 2014).

The 103 plant species were found to be used by Informants for 85 ailments, grouped into thirteen categories of use in district Quetta. The highest number of species were used in the treatment of gastrointestinal diseases (53 species and 98 use reports) followed by dermatological problems (29 species and 46 use reports) and respiratory disorders (27 species and 42 use reports) (Table 3).The gastrointestinal disorders are predominant across the globe and a size able number of plant species have been discovered to cure such illnesses. Ethnopharmaecological studies have shown that in some parts of the world, the gastrointestinal disorder is the first use category (Heinrich *et al*., 1998; Miraldi *et al*., 2001; Ghorbani, 2005; Ghorbani *et al*., 2011; Mosaddegh *et al*., 2012; Ullah *et al*., 2013; Nasab &Khosravi, 2014; Sadeghi *et al*.,2014; Bibi *et al*., 2014).

Table 3: Informant consensus factor, Percentage of species and citations for different use categories

S. No.	Disease category	No. of use reports	%age of use reports	No. of Species	%age of species used	Informant consensus factor (ICF)
1.	**Antidote** (Snake bite, scorpion sting)	4	1.4	2	1.04	0.67
	Blood circularity system disorders (Blood purifiers, cardiac problems/ heart problems, high blood pressure, low blood pressre)	13	4.5	12	6.22	0.08

2.	**Dermatological problems** (Anti dandruff, anti lice, Boils, burns, Eczema, fairness of face, healthy hair, itching of body, leprosy, long hair, marks on skin, pimples, skin diseases, skin tumors, ulcers/wounds, white spots)	46	16.08	29	15.02	0.38
3.	**Ear, nose and throat diseases** (ENT) (Earache, sore throat)	3	1.05	3	1.55	0
4.	**Eye diseases**	3	1.05	3	1.55	0
5.	**Gastrointestinal diseases** (appetizer, cholera, colic, constipation, contort, diarrhea digestion, dysentery, gastric, heart burn, hiccups, indigestion, nausea, nutrition/food, piles, purgative, stimulant, stomachache, stomach cooling, stomach problems, thirst quencher, under weights/ skinny, vermifuge, vomiting)	98	34.26	53	27.46	0.46
6.	**Glandular disorders** (Diabetes, hepatitis, Jaundice)	14	4.89	13	6.73	0.08
7.	**Infectious diseases** (Cooling of body, common fever, malarial fever, measles, pneumonia)	13	4.54	11	5.7	0.17
8.	**Musculoskeletal disorders**(Backache, gums pain, headache, joints pain, muscle stretch, muscular pain, toothache, toothpaste/miswak)	24	8.39	20	10.36	0.17
9.	**Narcotics** (to make sleep the babies)	2	0.69	2	1.04	0
10.	**Reproductive problems** (Abortion, anti fertility, cysts of ovary, postpartum pains, soften breasts, menstrual)	14	4.89	11	5.7	0.23
11.	**Respiratory diseases** (Asthma, chest problems, cold, cough, dry cough, whooping cough, flue)	42	14.68	27	13.99	0.35
12.	**Urogenital problems** (Diuretic, gonorrhea, kidney pain, kidney stones)	10	3.5	7	3.62	0.33

Quantitative analysis

FamilyImportancevalue(FIV), use values (UV_{is}) and use report (UR): The most common families as depicted by its FIV were Lamiaceae as the dominant family with 49 FIV followed by Asteraceae,Fabaceae (23 each) and apiaceae (19). The least values of FIV were observed for three families with only one FIV i.e. Elaeagnaceae, Juglandaceae and Santalaceae (Fig. 7)

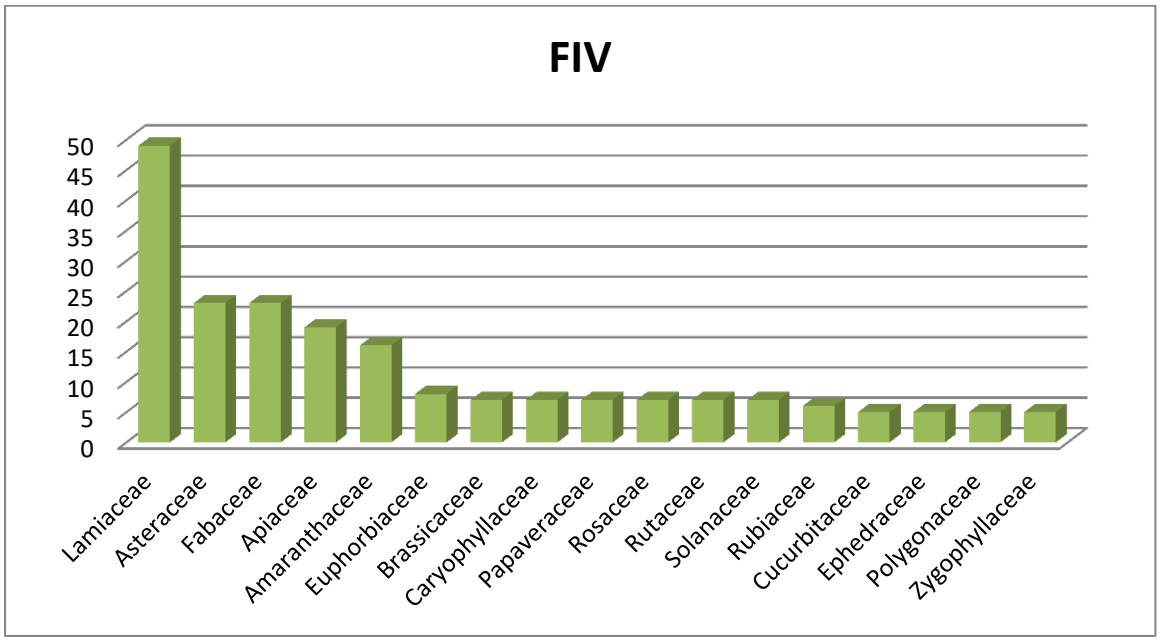

Fig. 7. Family importance value index

The species with greater use values were *Eleagnus angustifolia* (UV_{is} 0.42) *Caralluma tuberculata* and *Papaver somniferum* (UV_{is} 0.24 each)and *Citrus limon* (UV_{is} 0.23) and least use values were reported for *Veronica biloba* (0.01) (Table 1). High use values can be attributed to its frequent use in the treatment of various diseases with high use reports and number of informants showing that it is well accustomed by all the informants as an ethnomedicinal medicinal plant. Highest use report were calculated for *Ricinus communis*(6UR) followed by *Cassia fistula* ,*Citrus limon* , *Ephedra gerardiana, Lamium amplexicaule, Launaea nudicaulisMomordica charantia, Papaver somniferum* (5 UR for each) and least use report were calculated for 6 species *Eleagnus angustifolia, Hyoscyamus squarrosus,Juglans regia,Leontice ewersmanni,Onosma hispida, Veronica biloba*(1UR for each) (Table1). Number of ethnobotanical quantitative work has been done globally and in the other parts of the country (Bano *et al*., 2014 Nasab &Khosravi, 2014; Abbasi *et al*., 2013; Ahmad *et al*., 2014; Kiyani *et al*., 2014; Bibi *et al*.,2014) but there is a clear difference regarding most cited species, their Use reports and Use values. The differences may be due to variation in vegetation, ethnic groups, use patterns and geo-climate of the area.

Informant's consensus factor (FIC): To identify the most important used categories for the population studied, the informant consensus factor (FIC) was calculated for Antidote category and gastrointestinal disorders category exhibited the highest values (0.67, 0.46 FIC) respectively. While the least FIC was calculated for (ENT) ear nose and throat diseases, narcotics and eye diseases all are having the zero FIC (Table 3). Bibi*et al.* (2014) also reported the similar results for highest and lowest FICs for the same categories, she reported the highest FIC for Antidote category followed by gastrointestinal category for the plants of district Mastung. The similar FICs in both districts may be that the both districts are bordered with each other, so, the flora is not only similar but the ethnic compositions of the both districts are almost same. While, The main conditions included in the categories with higher FIC values were scorpion sting, insect bite, indigestion, digestion, abdomen pain, diarrhea, dysentery, gastric, jaundice, piles, vomiting,. These types of illness and clinical signs are common and are more easily identified by the Informants, which may explain why these categories exhibited the largest FIC values. (Chander *et al*., 2014).

Conclusions

The people of district Quetta, Balochistan, Pakistan use medicinal plants to treat different ailments. In spite of health care facilities in Quetta, the number of people relies on Informants for disease treatments. The present study is a comprehensive survey carried out covering all the sites of the district with systematic documentation. The medicinal plants with highest use values in the current study may sign post the probable existence of valuable phytochemical compounds, thus future phytochemical and pharmacological studies are needed to confirm the efficacy and safety aspects of the identified plants. The present study signifies a useful and long-lasting compilation, which can subsidize to preserve knowledge on the use of medicinal plants in this region and also encourage the interest of future generations on traditional healing practices. It may also supplement the socio economic conditions of the people while taking into account the conservation status of this valuable natural resource.

Acknowledgements

The authors acknowledge to the Higher Education Com- mission (HEC), Islamabad to carry out this research for providing indigenous scholarship for Ph. D. The authors are grateful to the local people and informants of District Quetta for providing the relevant ethnomedicinal information.

References

1. Abbasi, A.M., A.K. Mir,H.S. Munir, M.S. Mohammad, A. Mushtaq. 2013. Ethnobotanical appraisal and cultural values of medicinally important wild edible vegetables of Lesser Himalayas-Pakistan. *J.Ethnobiol. Ethnomed.*, 9: 66-79.
2. Ahmad, M., S. Shazia, S. Fazl-i-Hadi, T.B. Hadda, S, Rashid, M. Zafar, M.A. Khan, M.P.Z.Khan, G. Yaseen. 2014. An ethnobotanical study of medicinal plants in high mountainous region of Chail valley (District Swat-). *J. Ethnobiol. Ethnomed.*, 10: 1–36.
3. Anon, 2011. District development profile Quetta. Planning and Development Department, Government of Balochistan, Quetta.
4. Ayyanar, M., S. Ignacimuthu, 2005. Traditional knowledge of Kani tribals in Kouthalai of Tirunel velihills, Tamil Nadu, India. *J. Ethnopharmacol*., 102: 246–255.
5. Baloch, M.P., M.Y. Marri, M.A. Qaisrani, A. Baloch. 2013. Plants treasures, traditional knowledge and Baloch society. *Balochistan Review* XXVIII(1): 1810-2174.
6. Bano, A., M. Ahmad, A. Saboor, B.T. Hadda, M. Zafar, S. Sultana, M.P. Khan, M. Arshad, M.A. Ashraf. 2014. Quantitative ethnomedicinal study of plants used in the Skardu valley at high altitude of Karakoram-Himalayanrange, Pakistan. *J. Ethnobiol. Ethnomed*., 10: 43–71.
7. Bennett, B.C, L.T. Prance. 2000. Introduced plants in the indigenous pharmacopeia of northern South America. *Econ. Bot.* 54: 90–102.
8. Bhardwaj, M.J., S.K. Gakhar. 2005. Ethnomedicinal plants being used by the tribals of Mizoram to cure cut and wounds. *Indian J. Traditional Knowl.,* 4 (1): 75-80.
9. Bibi, T., M. Ahmad, N.M. Tareen, R. Jabeen, S. Sultana, M. Zafar, S. Zain-ul-Abidin. 2015. The endemic medicinal plants of Northern Balochistan, Pakistan and their uses in traditional medicine. *J. Ethnopharmacol.,* 173: 1–10.
10. Bibi, T., M. Ahmad, R.B. Tareen, N.M. Tareen, R. Jabeen, Saeed-Ur-Rehman, S. Sultana, M. Zafar, G. Yaseen.2014. Ethnobotany of medicinal plants in district Mastung of Balochistan province-Pakistan. *J. Ethnopharmacol.,* 157: 79–89.

11. Burkill, I.H. 1961.working list of flowering plants of Balochistan, West Pakistan Government Press, Karachi, 1961, p-03.
12. Cakilcioglu, U., I. Turkoglu. 2010. An ethnobotanical survey of medicinal plants in Sivrice (Elazig Turkey). *J. Ethnopharmacol.,* 132, 165–175.
13. Cámara-Leret, R., N. Paniagua-Zambrana, H. Balslev, M.J. Macía. 2014a. Ethnobotanical knowledge is vastly under-documented in northwestern South America. *PLOS One* 9: e85794.
14. Cámara-Leret, R., N. Paniagua-Zambrana, J.C. Svenning, H. Balslev, M.J. Macía. 2014b. Geospatial patterns in traditional knowledge serve in assessing intellectual property rights and benefit sharing in northwest South America. *J. Ethnopharmacol*., 158: 58–65.
15. Chander, M.P., C. Kartick, J. Gangadhar, P. Vijayachari. 2014. Ethno medicine and health care practices among Nicobarese of Car Nicobar – An indigenous tribe of Andaman and Nicobar Islands. *J. Ethnopharmacol.,* 158: 18–24.
16. Dwebaa, T.P., M.A. Mearns.2011. Conserving indigenous knowledge as the key to the current and future use of traditional vegetables *Int. J. Info. Manag.,* 31: 564–571.
17. Farnsworth, J.D. 1988. Screening plants for new medicines. In: Biodiversity. (Ed.): E.O. Wilson. National Academy Press, Washington DC, pp. 83-97.
18. Farnsworth, N.R., D.D. Soejarto. 1991. Global importance of medicinal plants. In: The Conservation of Medicinal Plants. (Eds.): O. Akerele, V. Heywood and H. Synge. Cambridge University Press, pp. 25-51. Flora of Pakistan. In: Ali, S.I., Nasir, E. (Eds.), pp. 01–215.
19. Gazzaneo, L.R.S., R.F.P. Lucena, U.P. Albuquerque. 2005. Knowledge and useof medicinal plants by local specialists in a region of Atlantic forest in the state of Pernambuco (Northeastern Brazil). *J. Ethnobiol. Ethnomed.,* 1: 1–11.
20. Ghimire, S.K., D. McKey, Y. Aumeeruddy-Thomas. 2006. Himalayan medicinal plant diversity in an ecologically complex high altitude anthropogenic landscape, Dolpo, Nepal. *Environ.Conserv.*, 33: 128-140.
21. Ghorbani, A. 2005. Studies on pharmaceutical ethnobotany in the region of Turkmen Sahra, North of Iran (Part1): general results. *J. Ethnopharmacol.,* 102: 58–68.
22. Ghorbani, A., G. Langenberger, L. Feng, J. Sauerborn. 2011. Ethnobotanical study of medicinal plants utilized by Haniethnicity in Nabanriver Watershed National Nature Reserve, Yunnan, China. *J. Ethnopharmacol.,* 134: 651–667.
23. Giday, M., Z. Asfaw, Z. Woldu. 2009. Medicinal plants of the Meinitethnic group of Ethiopia: an ethnobotanical study. *J. Ethnopharmacol.,* 124: 513–521.
24. Giday, M., Z. Asfaw, Z. Woldu. 2010. Ethnomedicinal study of plants used by Sheko ethnic group of Ethiopia. *J. Ethnopharmacol.,* 132: 75–85.
25. Gonzalez, J.A., M. Garcia-Barrriuso, F. Amich. 2010. Ethnobotanical study of medicinal plants traditionally used in the Arribesdel Duero, Western Spain. *J. Ethnopharmacol.,* 131: 343–355.
26. Goodman, S.M., A. Ghafoor. 1992. The Ethnobotany of Southern Balochistan, Pakistan with particular reference to medicinal plants. *Fieldiana Botany*, 31: 1–84.
27. Halberstein, R.A. 2005. Medicinal plants: historical and cross cultural usage patterns. *Annals of Epidemiology*, 15: 686–699.
28. Heinrich, M., A. Ankli, B. Frei, C. Weimann, O.Sticher. 1998. Medicinal plants in Mexico: healers's consensus and cultural importance. *Social Science and Medicine*, 47: 1859–1871.
29. Ibrar, M., F. Hussain, A. Sultan. 2007. Ethnobotanical studies on plant resources of Ranyal Hills, District Shangla, Pakistan. Pak. J. Bot. 2: 329–337.
30. Ignacimuthu, S., M. Ayyanar, K. Sankarasivaraman. 2006. Ethnobotanical investigations among tribes in Madurai district of Tamil Nadu, India. *J. Ethnobiol. Ethnomed*., 11: 2.

31. Ignacimuthu, S., M. Ayyanar, K. Sankarasivaraman. 2008. Ethnobotanical study of medicinal plants used by Paliyar tribals in Theni district of Tamil Nadu, India. *Fitoterapia* 79: 562–568.
32. Jan, G., M.A. Khan, J.F.G. Farhatullah, M. Ahmad, M. Jan, M. Zafar. 2011. Ethnobotanical studies on some useful plants of Dir Kohistan valleys, KPK, Pakistan. Pakistan J. Bot., 43(4): 1849–1852.
33. Jordan, S.A., D.G. Cunningham, R.J. Marles. 2010. Assessment of herbal medicinal products: challenges, and opportunities to increase the knowledgebase for safety assessment. *Toxicol. Applied Pharmacol.* 243: 198–216.
34. Junsongduang, A., H. Balslev, A Inta, A. Jampeetong, P. Wangpakapattanawong. 2014. Karen and Lawa medicinal plant use: uniformity or ethnic divergence? *J. Ethnopharmacol.*, 151: 517–527.
35. Kala, C.P. 2007. Local preferences of ethnobotanical species in the Indian Himalaya: Implications for environmental conservation. *Current Science* 93 (12): 1828–1834.
36. Kayani, S., M. Ahmad, M. Zafar, S. Shazia, M.P.Z. Khan, M.A. Ashraf, J. Hussain, G. Yaseen.2014. Ethnobotanical uses of medicinal plants for respiratory disorders among the inhabitants of Gallies Abbottabad, Northern Pakistan. *J. Ethnopharmacol.,* 156: 47–60.
37. Khan, A.M. 2011. Ministry of Food, Agriculture and Livestock, Qarshi Industries (Pvt) Limited, -3, www.minfa.gov.pk/admin/publications p (retrieved on 01-07- 2011).
38. Lambert, J., J. Srivastava, N. Vietmeyer. 1997. Medicinal plants: Rescuing a Global Heritage, ed, The World Bank, USA.
39. Leporatti, M.L., L. Lattanzi. 1994. Traditional phytotherapy on coastal area of Makran (Southern Pakistan). *Fitoterapia*65(2): 158–161.
40. Leslie, C., A. Young. 1992. Paths to Asian Medical Knowledge. University of California Press, Berkely, California
41. Mahishi, P., B.H. Srinivasa, M.B. Shivanna. 2005. Medicinal plant wealth of local communities in some villages in Shimoga District of Karnataka, India. *J. Ethnopharmacol.,* 98: 307–312.
42. Manzoor, M., A. Ayesha, M.J. Durrani. 2013. Uses of fruits, vegetables and herbs for the treatment of diabetes by the people of Quetta city. *Sci. Technol. Develop.,* 32(1): 24–27.
43. Miraldi, E., S. Ferri, V. Mostaghimi. 2001. Botanical drugs and preparations in the traditional medicine of West Azerbaijan (Iran). *J. Ethnopharmacol.,* 75: 77–87.
44. Mosaddegh, M., F. Naghibi, H. Moazzeni, A. Pirani, S. Esmaeili. 2012. Ethnobotanical survey of herbal remedies traditionally used in Kohghiluyehva Boyer Ahmad province of Iran. *J. Ethnopharmacol.,*141: 80–95.
45. Nasab, K.F., A.R. Khosravi. 2014. Ethnobotanical study of medicinal plants of Sirjan in Kerman Province, Iran. *J. Ethnopharmacol.,* 154: 190–197.
46. Neves, J.M., C. Matos, C. Moutinho, G. Queiroz, L.R. Gomes. 2009. Ethnopharmacological notes about ancient uses of medicinal plants in Trasos Montes (northern of Portugal*). J. Ethnopharmacol.,* 124: 270–283.
47. Odora Hoppers, C.A. 2002. Indigenous knowledge and the integration of knowledge systems: Towards a philosophy of articulation. Claremont: New Africa Books.
48. Qureshi, R. 2012. Medicinal flora Of Hingol National Park, Baluchistan, Pakistan. *Pak. J. Bot.*44(2): 725–732.
49. Ritter, R.A., M.V. Monteiro, F.O. Monteiro *et al*., 2012. Ethnoveterinary knowledge and practices at Colares Island, Parastate, eastern Amazon, Brazil. *J. Ethnopharmacol.,* 144: 346–352.
50. Rokaya, M.B., Z. Münzbergova, B. Timsina. 2010. Ethnobotanical study of medicinal plants from the Humla district of western Nepal. J. Ethnopharmacol., 130: 485–504.

51. Rokaya, M.B., Y. Uprety, R.C. Poudel, B. Timsina, Z. Münzbergvá, H. Asselin, A. Tiwari, S.S.Shrestha, R.S. Sigdel. 2014. Traditional uses of medicinal plants in gastrointestinal disorders in Nepal. *J. Ethnopharmacol.,* 158: 221–229.
52. Sadeghi, Z., K. Kuhestani, V. Abdollahi, A. Mahmood. 2014. Ethnopharmacological studies of indigenous medicinal plants of Saravan region, Baluchistan. Iranian. *J. Ethnopharmacol*., 153: 111–118.
53. Shah, S.R.U., G. Hassan, A. Rehman, I. Ahmed. 2006. Ehtnobotanical studies of the Flora of district Musakhel and Barkhan in Balochistan, Pakistan. Pak. J. Weed Sci. Res. 12(3): 199–211.
54. Shaheen, H., Z.K. Shinwari, R.A. Qureshi, Z. Ullah. 2012. Indigenous plant resources and their utilization practices in village populations of Kashmir Himalayas. *Pak. J. Bot.*, 44(2): 739-745.
55. Sharma, P.P., A.M. Mujundar. 2003. Traditional knowledge on plants from Toranmal Plateau of Maharastra, India. *Indian J. Traditional Knowl.*, 2: 292-296.
56. Shepard Jr., G.H., 2004. A sensory ecology of medicinal plant therapy in two Amazonian societies. *American Anthropologist*, 106: 252–266.
57. Shinwari, Z.K. 2010. Medicinal plants research in Pakistan. *J. Med. Plant Res.,* 4(3): 161-176.
58. Shinwari, Z.K., S. Malik. 1989. Plant wealth of Dera Bughti area.*Progressive Farming,* 9: 39–42.
59. Shinwari, Z.K., T. Watanabe, Z. Yousaf. 2000. Medicinal plants of Pakistan: an overview. Proceeding of Nepal-Japan Joint Symposium on Conservation and Utilization of Himalayan Medicinal Resources, Kathmandu, Nepal. pp.298-304.
60. Srithi, K., H. Balslev, P. Wangpakapattanawong, P. Srisanga, C. Trisonthi. 2009. Medicinal plant knowledge and its erosion among the Mien (Yao) innorthern Thailand. *J. Ethnopharmacol.,* 123: 335–342.
61. Srithi, K., C. Trionthie, P. Wangpakapattanawong, H. Balslev. 2012. Medicinal plants used in Hmong women's health care in northern Thailand. *J. Ethnopharmacol.,* 139: 119–135.
62. Tareen, R.B., T. Bibi, M.A. Khan, M. Ahmad, M. Zafar. 2010. Indigenous knowledge of folk medicines by the women of Kalat and Khuzdar regions of Balochistan, Pakistan. Pak. J. Bot. 42(3): 1465–1485.
63. Ullah, M., Usman, M. Khan, A. Mahmood, M. Hussain, S. Wazir, M. Daud, Z. Shinwari. 2013. An ethnobotanical survey of indigenous medicinal plants in Wana district south Wazirist anagency, Pakistan. *J. Ethnopharmacol.,* 150: 918–924.
64. Ummara, U., T.Z. Bokhari, A. Altaf, U. Younis, A.A. Dasti. 2013. Pharmacological study of Shogran Valley Flora, Pakistan. *Int. J. Scientific Engineer. Res*. 4 (9): 1–9.
65. Uniyal, S.K., K.N. Singh, P. Jamwal, B. Lal. 2006. Traditional use of medicinal plants among the tribal communities Chhota, Western Himalaya. *J. Ethnobiol. Ethnomed.,* 2: 14.
66. Vandebroek, I. 2010. The dual Intracultural and intercultural relationship between medicinal plant knowledge and consensus. *Econom. Bot.,* 64: 303–317.
67. Vitalini, S., M. Iriti, C. Puricelli, D. Ciuchi, A. Segale, G. Fico. 2013. Traditional knowledge on medicinal and food plants used in ValSan Giacomo (Sondrio, Italy) an alpine ethnobotanical study. *J. Ethnopharmacol.,* 145: 517–529.
68. World Health Organisation. 2001. General Guidelines for Methodologies on Research and Evaluation of Traditional Medicine. WHO, Geneva, Switzerland p. 1.
69. World Health Organisation. 2002. Traditional and Alternative Medicine, fact sheet No. 271.