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MEDICINAL FLORA OF PANJGOOR DISTRICT, BALOCHISTAN: AN ETHNOBOTANICAL STUDY OF TRADITIONAL PLANT-BASED HEALTHCARE

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Abstract

Since traditional herbal remedies are based on ancestral knowledge and empiric experiences. An ethnomedicinal survey was undertaken to collect information of indigenous knowledge about the use of medicinal plants which are being utilized by the local inhabitants of district Panjgur for the treatment of different diseases. The indigenous knowledge was collected by interviewing 200local people of different age groups through structure, semistructured and open ended questionnaire. Results were analyzed using quantitative indices of use value (UV), frequency citation (FC) and relative frequency citation (RFC). A total of 122 plants belonging to 59 families were used by the natives of the study area for the treatment of such ailments as stomachache, sore throat, gum diseases, diabetes, jaundice, fever, cold, cough and snake bite, evil eyes and evil spirits.The vernacular (Balochi) names of the species, plant parts used, method of administration, dosage were recorded. The leaves were noted as most frequently used parts (25%). Powder was the most commonly used preparation method (25%). The

highest use value was reported for the two species Chenopodium album and Tamarix galica (0.6) for each while highest RFC value was calculated for Peganum harmala and Myrtus communis (0.18). It was also scrutinized that the inhabitants of Panjgur not only rely on medicinal plants produced in the area but also medicinal plants imported from different areas of country and out of country. It is concluded from the study that the area is rich in medicinal plants and these plants are still commonly used for medicinal purposes among the people in their daily lives. However, indigenous knowledge of medicinal plants is now fast disappearing due to modern healthcare system.

1. Introduction

Plants play a very important role in our lives from the very beginning of human lives and serve as backbone of all life existing on earth. Since knowing the worth of plants, human study plants in different contexts and as well as the relationship between plants and people, which is known as ethnobotany. This interdisciplinary field is so vast that it includes studying from wild plants to agricultural crops, from herbal medication to cultural myths and religious ceremonies, from clothing to house construction. (Balick and Cox 1996).

The history of medicine and surgery is as old as the origin of human being. Plants are used as a source of medication and this knowledge is passed from generation to generation making the traditional health care system of different countries of the world. (Khan et al; 2012). The ancient Egyptians, Indian Ayurveda and Siddha medicine show the oldest records of plant medication which date back to 2,000 B.C. (Arzu and Thiagarajan 2016).Traditional knowledge constitutively benefits human being with new remedies. (Ullah, Iqbal et al. 2010). In the whole world, due to its enormous benefits considered a precious heritage, especially in developing countries. (Bogaert, Shalukoma et al. 2016)

About 80% of human population use medicinal plants to combat with diseases. Traditional medicines are the main source for primary health care for the majority of the rural people and poor people living in urban regions. (Mesfin, Demissew et al. 2009). An estimated number of plants species ranging from 35,000 to 70,000 used all over the world for the treatment of different diseases and out of which 6,500 species have been used in Asia. (Rajaei and Mohamadi 2012). Pakistan is bestowed with a rich floral diversity. There are about 1572 genera and around 6000 wild plant species and about 600 medicinal plants are used by local communities to cure different diseases.(Ahmad, Sultana et al. 2014)

The Practice of traditional knowledge is different in different areas of the world. Each indigenous culture has its own way of medicinal plants preparation methods, administrative methods, passing of oral knowledge and preserving. This knowledge exists in oral with no documentation in the indigenous communities, which makes it vulnerable to be lost. The documentation of traditional knowledge is required to preserve the knowledge in order to have new drug discoveries and improvement. Ethiopia is progressively endeavoring to shield their hereditary sources and traditional knowledge through preservation and national law. (Fenetahun, Eshetu et al. 2017). The traditional healers are playing a vital role in community healthcare and drug development along with the conservation of traditional knowledge and biodiversity. (Cheikhyoussef, Shapi et al. 2011)

Traditional medicinal plants have played great role in the discovery of modern drugs(Elansary, Mahmoud et al. 2015). The anti-cancer drugs vinblastine and taxol as well as the anti-malarial drug artemisinin came from plants. (Queiroz, Wolfender et al. 2009) The treatment of cardiovascular disease in Native American traditional medicine is unique and can help modern medicinal treatment. The medicinal

plants used in Traditional Chinese Medicine have phytochemicals like artesunate, homoharringtonine, and cantharidin, which are used for the treatment of cancer. (Rahmatullah, Ferdausi et al. 2010)

Along with the Third World, especially in Western Europe, the use of traditional medicine has increased even though the modern medicines are available.(Bahmani, Karamati et al. 2014) Herbal medicines importance and usage has increased in developed countries thus providing economic development of countries. (Bahmani, Zargaran et al. 2014)

In Balochistan, few ethnobotanical investigations are done, which include Shinwari and Malik (1989) researched on medicinal plants of Dera Bughti area; Goodman and Ghafoor (1992) ethnobotany of Southern Balochistan; Manzoor, et al. (2013) investigated the uses of fruits, vegetables and herbs for the treatment of diabetes by the people of Quetta city. (Bibi, Ahmad et al. 2014). In the study area, no ethnobotanical studies have been carried out before and so the present study can be considered as the first one, which investigates ethnobotanical study on medicinal plants in this region. The study area is famous for five graves and date palms.

2.Material and method

2.1. District Panjgur geo-ethnographical overview

District Panjgur is located in west Balochistan. The total area of district is 16,891 km2. Panjgur District lies between 63°04'50"-65°20'11" East longitudes and 26°08'54"-27°17'55" North latitudes. Panjgur (literally: Five Graves) has several archaeological sites, including centuries-old tombs, an old dam called Band-e-Gillar, Tomb of Malik Asa, Band-e-Gillar, Fort of Nawab Habibullah Khan, Shrine of Shah Qalandar, Shrine of Pir Umar. (GoB, 2011). (Figure 1).

The local language is Balochi, which has more persian words than other balochi spoken in other places of Balochistan. The second language spoken in district is urdu. (GoB, 2011). (Figure 1).

2.2. Socio-economic conditions of the area

The district has bestowed with the best quality date palms and historically, in the 4th century BC when Alexander the Great traveled through the Ketch Valley of Balochistan date palm was already grown in the area.(Baloch and Thapa 2016). However, there is insufficiency of water but still the district is potential for fruit farming. The major fruits produced are Almond, Apple, Grapes, Peach, Plum, Pomegranate, Dates, Mangoes and Fig in the area. Wheat occupied a maximum area of 4,885 hectares. Tomatoes is cultivated on a maximum area of 78 hectares, Lady finger cultivated on an area of 64 hectares, Broad bean and Carrots each with 40 hectares at the district level during the year 2008-09. Date fruits are exported to many cities of Pakistan including Karachi, Quetta and Sukkur (GoB, 2011).

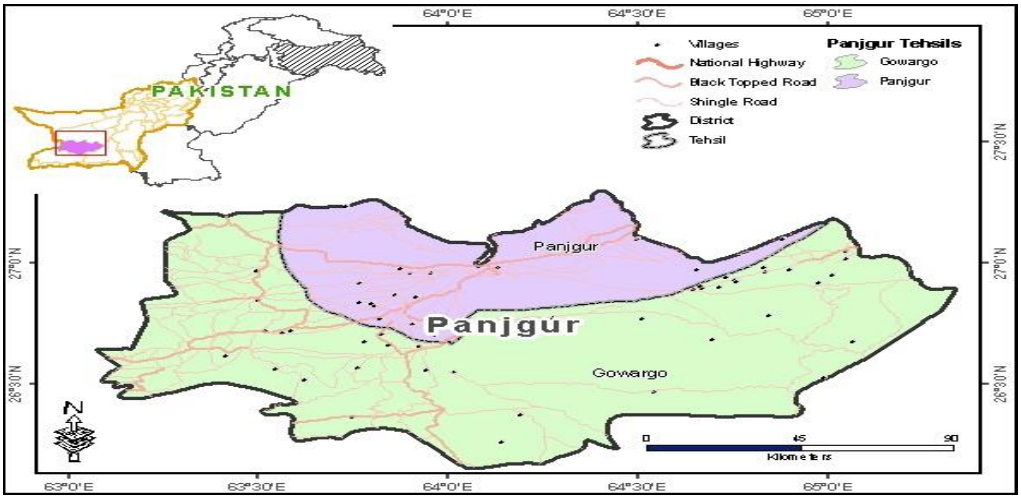


Figure 1

2.3. Field interviews

The indigenous knowledge was collected by listing interviews with randomly selected informants and field interviews with local women after free listing (Ghorbani et al., 2011). Questionnaire contained structure, semistructured and open ended questions. To obtain indigenous knowledge practiced in the area, 200 local women were interviewed having the traditional knowledge belonging to three age groups i.e. 21–40, 41–60 and 61–80 years old. The local language Balochi was used during interview to have more accurate data.

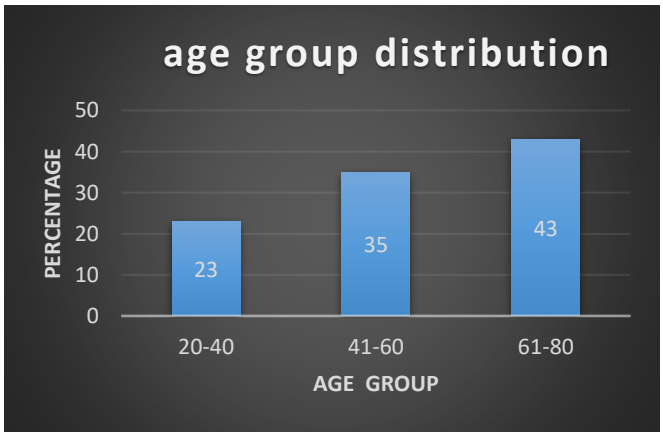


Figure 2

2.4. Collection, identification and deposition of medicinal plants

Plants were collected and preserved with accordance of routine herbarium techniques recommended by Jain and Rao (1977). All plants were identified and reconfirmation of plants identification was done with the help of Flora of Pakistan Nasir and Ali (1970-1979), Nasir and Ali(1980-1989), Ali and Nasir,1989–1991 and Ali and Qaiser (1993-2007).Voucher specimens weredeposited in the herbarium of Department of Botany SBKWs university Quetta.

2.5. Quantitative analysis of ethnobotanical results

The indigenous medicinal information of plant species was analyzed using quantitative value indices.

2.5.1. Informant consensus factor (ICF)

Informant consensus factor (ICF) is applied to check the homogeneity of knowledge on the ethno-pharmacological use of collected species in the illness categories between the populations. ICF was calculated using the following formula:

ICF(0-1)=Nur-Nt/Nur-1 (Trotter and Logan , Heinrich, Ankli et al. 1998, Yaseen, Ahmad et al. 2015) where Nur = total number of use reports for each disease category and Nt= total number of taxa used in that category. The highest value of ICF should be near to one.

2.5.2. Frequency citation (FC)

The FC of medicinal was calculated by the formula FC= (Number of times a particular species was mentioned/ total number of times that all species were mentioned) ×100 (Tardío and Pardo-de-Santayana 2008).

2.5.3. Relative frequency citation (RFC): Relative frequency citation (RFC) index was done (Tardio and Pardo-de Santayana, 2008) by using the following formula: RFC=FC⁄N

RFC is obtained by dividing the number of informants who mentioned the use of a useful species FC or frequency of citation by the total number of informants.

2.5.4. Use value (UV)

The use value was calculated by using the following formula $UV = \frac{\sum Ui}{N}$ where Ui is the number of uses told by each informant for a given species and N is the total number of informants.

3. Results and discussion

3.1. Use of plants and demography

During field work 200 women inhabitant of District Panjgur were interviewed. Informants were divided into three age groups; 43% of informants were in age group of 61-80, 35% were 41-60 age group and 23% were 20-40 age group (Fig. 2). A total of 59 families and 122 species with their vernacular names, family names, their uses and parts of the plants used for their medicinal values, use report, use value, frequency citation (FC) and relative frequency citation (RFC) are recorded in Table 1. Family Lmiaceae (with 14 species) was the largest family following Apiaceae (with 10 species), Sloanaceae (with 7 species), Asteraceae and Fabaceae (each with 5 species). (Table 2). The most used method of medicinal plants preparation recorded was

Table 1 Medicinal Plants with their vernacular names, Family name, Method of use in District Panjgoor

S/N	Botanical names	family name	vernacular name	part used	ailment	method of use	FC	UR	UV	RFC
1.	*Achilea millefolium*	Malvaceae	Brinjask	Whole plant	1.Stomachache, Cardiac problems 2.Blood Cleanser	1. Brinjask and dried lemon are soaked in water over night and used early in morning 2. Soaked in water	24	3	0.13	0.12
2.	*Achillea santolina*	Asteraceae	Boemadran	Flowers	Stomachache, vomiting, heart pain	Soaked in water, left to stand overnight. One cup is used early in morning	26	3	0.12	0.13
3.	*Allium Cepa*	Liliaceae	Pimaz	Seed Bulb	Caries 1). Whitlow, stuck thorn in flashes	Seeds are cooked in mustard oil and placed on a knife afterwards knife is kept on a pot having water in it and then patient is fumigated 1). Cut into two pieces, middle portion is removed gwane gwanjak (gum) is kept in the	10	5	0.50	0.05

					2). Otalgia 3). Hepatitis	place of middle portion the two pieces are rejoined with the help of a wet cloth and kept in hot ashes. After few minutes it is taken out and the piece of the cloth is removed and crushed and mixed pure ghee and applied on an affected area 2). Juice extraction is dropped in air 3). Worn around the neck with the help of thread				
4.	*Allium sativum*	Liliaceae	Sirk	Bulb	High blood pressure	Taken as tablets with water	15	1	0.07	0.075
5.	*Aloe vera*	*Asphodelaceae*	Garz-e-harwa	Leaves Gel	1)Joint pains 2)Itching	Cut into pieces and the sap side is kept on joints Gel is applied	13	2	0.15	0.065
6.	*Azardica indica*	Meliaceae	Shresh	Seed Leaves	Cephalalgia	Powdered seeds are cooked in mustard oil and made into past and applied on head and then head is covered with cloth 1)Gurgled by decoction	25	4	0.16	0.125

					1). Sore throate 2)Diabetes 3)Fever hotness	2)Soaked in water and one cup is used 3)Herbal bath is taken from chopped leaves infusion				
7.	*Berberis balochistanica*	Berberidaceae	Zarch	Stem	1). Waist pain, Lumbago 2)Hepatitis	1.Densely cooked "down to syrup" that only one cup left behind in pot and the syrup is used 2.Decoction is used	19	3	0.16	0.095
8.	*Blepharis ciliaris*	Acanthaceae	Sag-e-dantan	Seeds	Stomach pain	Powder is used	9	1	0.11	0.045
9.	*Blepharis sindica*	Acanthaceae	Kala jiri	Seeds	Eye pimple, eye burn, conjunctivitis	Seeds are kept in lower eyelid	20	3	0.15	0.1
10.	*Bowsellia serrata*	Burseraceae	Kundrik/ kunzak	Gum	Backache, leg pain, Lumbago	Past is made with water and whole body plastered with past	15	3	0.20	0.075

11.	*Butea monosperma*	Fabaceae	Sench / Gasu pul	Flower	1.Dry chest 2.Chest pain, cough 3.Stomachache	1.Podwer of sench and halikdar (Turmeric) is used with water or milk 2.Boiled with a little guggle and decoction is used 3.Decoction is used	17	4	0.24	0.085
12.	*Cactus spp*	Cactaceae	Arva	Gum	1)sore throat, Pharyngitis 2)Fever	1)powder is placed in a piece of white cloth and inhaled at intervals 2)powder is taken orally with water	11	3	0.27	0.055
13.	*Calotropis procera*	Asclepiadaceae	Kark	Leaves Latex Flower	Foot pain, Stuck thorns in flash Prediction of boy or girl baby	Leaves wormed on hot plate and then bound on affected area Latex is applied on the body parts where thorns are stuck to prevent infection and allow thorn to come out Bud is popped up. If bud popped with a sound, then coming baby would be a boy.	29	3	0.10	0.145

14.	*Capparis decidua*	Capparaceae	Kalir	Fruit	Diabetes	Cut into pieces and applied salt over pieces and kept overnight and next day cooked and used	22	1	0.05	0.11
15.	*Capsicum annuam*	Solanaceae	Sohren mirch	Fruit	Warding off against Evil eyes	Fruits of red chili are fumigated	32	1	0.03	0.16
16.	*Caralluma tuberculata*	Asclepiadaceae	Marmoothk	Fruit	1)Stomach ache, Blood pressure 2)Malaria 3)Diabetes 4) Dil-e-kirm (Heart worm)	1)Warmed on hot plat till brown then curled with a little misrisagar(candied sugar) to powder and used early in morning 2) decoction is used 3)fruit is squeezed in a cloth, shade dried and then ground to powder and taken with water 4) used as salad	28	5	0.18	0.14
17.	*Cardaria chalepensis*	Brassicaceae	Garbust	Leaves	Skin disease	Past of leaves applied on affected area	8	1	0.13	0.04
18.	*Carthamus tinctorius*	Asteraceae	Pulm	Leaves	Mouth rashes,	Leaves are chewed and powder is applied on mouth rashes as well	13	2	0.15	0.065

					aphthous ulcer					
19.	*Cassia acutifolia*	Fabaceae	Sana maki	Leaves	Constipation	Ground to powder and one table spoon is taken	17	1	0.06	0.085
20.	*Cassia fistula*	Caesalpiniaceae	Bakam	Seeds	Constipation, flatting tummy	Decoction is used	25	2	0.08	0.125
21.	*Chenopodium album*	Chenopodiaceae	Gathri	Seed	Antidote for Snake bite	Crushed and mixed with glass of water and given at once	5	3	0.60	0.025
22.	*Cinnamomum zeylanicun*	Lauracae	Darcheeni	Bark	Flu, cold	Decoction is used	12	2	0.17	0.06
23.	*Citrullus colocynthus*	Cucerbitaceae	kulkoshtag	Fruit Seed	1)Hotness in feet and hand 2)Big tummy 3)Fever	1)Kept in a pot and crushed by feet then hands and feet are left for few minutes in crushed fruit 2)Fruits are crushed and pulp is placed on stomach 3)Seven seeds are cooked in oil; and massaged on joints	28	3	0.11	0.14
24.	*Citrus limon*	Rutaceae	Lembo	Fruit	Clean kidney, Calculus,	Cut into two pieces and salt is applied and lapsed	9	3	0.33	0.045

				Sap of lamon	Splenomegaly	Orally taken with water				
25.	*Cocculus antiguorum*	Iridaceae	Zafran	Stigma	1.Evil spirits, Djinns 2.Measeles	1.Past made with water and marked on joints to protect from Evil Spirits and Djinns 2.Mixed with water and taken orally and massaged on whole body	20	2	0.10	0.1
26.	*Cocculus pendulus*	Menispermaceae	Zamur	Leaves	1)Epitaxis 2). As refrigerants 3).Cephalalgia	1.Past made with water massaged on head at night and next day herbal bath is taken from strained water of it 2.Along with apple leaves soaked overnight and used early in morning 3.powder is taken with water	16	3	0.19	0.08
27.	*Commiphora mukul*	Burseraceae	Guggle	Resin	1.Toothache, Carries 2. Skin eruption, Pruritus, paralysis	1.Kept in tooth 2. Powder is applied on affected areas	15	5	0.33	0.075
28.	*Consolida ambigua*	Ranunculaceae		Seeds	Killing lice	Powder of seeds made into past and applied on head	8	1	0.13	0.04

29.	*Corchorus depressus*	Tiliaceae	Mundary	Whole plant	Stomachache, Dysentery	Mixed with cured and eaten	10	2	0.20	0.05
30.	*Coriandrum sativum*	Apiaceae	Gehnech	Seeds	Blood pressure	Decoction is used early in morning	12	3	0.25	0.06
31.	*Crotalaria burhia*	Fabaceae	Lanto	Whole plant	Hepatitis, yellow fever	One glass of infusion is used daily and herbal bath is taken from infusion	7	2	0.29	0.035
32.	*Cuminum cyminum*	Apiaceae	Spethe zerag	Seeds	Flatulence	Few seeds are taken orally early in morning for seven days	9	1	0.11	0.045
33.	*Curcuma longa*	Zingiberaceae	Halikdar	Rhizome	1)Ring worm, Tinea corporis 2)Otalgia	1)Past is applied on affected area 2)Sugar is dissolved in water and dropped in ear then powder of turmeric is sprinkled	18	3	0.17	0.09
34.	*Cynodon dactylon*	Poaceae	Chaddh	Leaves Seeds	Ulcer Loose Motion	Infusion is used early in morning Infusion is used	6	2	0.33	0.03
35.	*Descurainia Sophia*	Brassicaceae	Mathergaho	Seeds	Vomiting, Diarrhea	1 table spoon of powder is taken daily	10	2	0.20	0.05
36.	*Dodonea viscosa*	Sapindaceae	Gethechk	Leaves	Bronchitis, cough	1.past is applied on head 2.Ground leaves are inhaled	25	2	0.08	0.125

37.	*Dorema ammoniacum*	Apiaceae	Hushtrik	Gum	Skin eruptions	Powder is applied on skin	13	1	0.08	0.065
38.	*Ducrosia anthifolia*	Apiaceae	Gwathag	Seeds	Flatulence, stomachache	Soaked in water and one cup is used	19	2	0.11	0.095
39.	*Elaeagnus angustifolia*	Elaeagnaceae	Sinjidan	Fruit	Stomachache	Eaten raw	8	1	0.13	0.04
40.	*Eucalyptus citriodora*	Myrtaceae	Balm	Leaves	Cough	Used as tea and also leaf is kept in mouth before going to bed	6	1	0.17	0.03
41.	*Euphorbia helioscopia*	Euphorbiaceae	Gurbagund	Whole plant	Galactagogue for Rabbit	Given as fodder	7	1	0.14	0.035
42.	*Ferula asafoetida*	Apiaceae	Hing-e-sheerag Hing-e-tak	Gum Leaves	Toothache Dil-e-kirm (Heart worm)	Kept in affected tooth One cup of decoction is used	18	2	0.11	0.09
43.	*Ferula oopoda*	Apiacea	Hingi patrek	Leaves	Dil-e-kirm (Heart worm)	1 tbsp of powder is taken daily	9	1	0.11	0.045
44.	*Ficus carica*	Moraceae	Anjeer	Fruit	Calculus	Seven seeds are taken early in morning in empty stomach for seven days	10	1	0.10	0.05

45.	*Foeniculum vulgare*	Apiaceae	Raz	Whole plant, Seeds	As refrigerant, Stomachache	Eaten raw	15	2	0.13	0.075
46.	*Gaillonia aucheri*	Gentianaceae	Tusso	Leaves	Stomachache	Soaked in water, strained and one cup of infusion is used	30	1	0.03	0.15
47.	*Gentiana olivieri*	Gentianaceae	Bangera	Flowers	Cough	One cup of decoction is used	8	1	0.13	0.04
48.	*Glycyrrhiza glabra*	Fabaceae	Washdar	Stem	Gum diseases, Carries	Used as tooth brush as well as decoction is used	17	2	0.12	0.085
49.	*Gossypium*	Malvaceae	Kappas	Seeds	Skin eruption, Eczema	Powder is applied	6	2	0.33	0.03
50.	*Haloxylon salicornicum*	Amaranthaceae	Tarat	Whole plant	1)Scabies, itching 2)Fertilizer	1)Decoction is used and as well herbal bath is taken 2)Used in rice paddies in order to rotten the paddies	12	3	0.25	0.06
51.	*Heliotropium strigosum*	Boraginaceae	Sading	Whole plant	Calculus	One cup of decoction is used twice a day	5	1	0.20	0.025
52.	*Hertia intermedia*	Asteraceae	Mangoli	Leaves	Stomachache	Powder is taken orally with water	10	1	0.10	0.05

53.	*Hordeum vulgare*	Poaceae	Jawak	Seeds	Eye sore, Conjunctio n	Without informing anyone early in morning some seeds are placed in a wet cloth and fastenly chewed then rinsed out in eyes	6	2	0.33	0.03
54.	*Hyoscyamus falezlez*	Solanaceae	Kohi bang	Leaves	Weakness, puniness	Less than one teaspoon of juice is given. Side effects may be observed in some person with severe illness	13	1	0.08	0.065
55.	*Isodon rugosus*	Lamiaceae	Hasanbota m	Leaves	stomachach e	Soaked in water left to stand overnight, strained and one cup is used early in morning and one cup in evening	5	1	0.20	0.025
56.	*Juniperus excels*	Cupressaca eae	Apurs	Cone	Allergy, Urticaria, Eczema	Electuary made by mixing powder of cone with hurmag-e-sheerag(honey of date) is taken orally	18	3	0.17	0.09
57.	*Lawsonia ineremis*	Lythraceae	Hinny	Leaves	Warts	Past is applied	12	1	0.08	0.06
58.	*Linium usitatissinu m*	Linaceae	Burz	Seeds	Dry chest	Warmed on hot plat till brown and then ground to powder and used with water (if sound comes out from chest then not given)	9	1	0.11	0.045

59.	*Matricaria lasiocarpa*	Asteraceae	Sped pul	Flower	1.Neuritis 2.Stomachache , Vomiting and nausea	1.Soaked in water along with a little ALUM over-night and used early in morning 2.Decoction is used	10	1	0.10	0.05
60.	*Mentha spicata*	Lamiaceae	Podina	Leaves	Hurt burns	Taken as salad and tea is taken	13	3	0.23	0.065
61.	*Menthe longifolia*	Lamiaceae	Purchenk	Whole plant	1.As refrigerant 2.Heart burn	1.Hearbal bath is taken from strained water 2.One cup of decoction is used	16	1	0.06	0.08
62.	*Mimulus moschatus*	Scrophulariaceae	Misk	Flowers	1.Vomiting , nausea 2.Cephalalgia	1.Taken orally 2.mixed with oil and massaged on head	9	2	0.22	0.045
63.	*Morus alba*	Moraceae	thooth	Leaves	Boils	Past is applied on boils and bandaged with cloth	6	2	0.33	0.03
64.	*Myristica fragrans*	Myristicaceae	Jauzebak	Seeds	Diuretic, Urine retention	Powder is used with water	15	2	0.13	0.075
65.	*Myrtus communis*	Myrtaceae	Morth	Leaves	1.As refrigerant	1.Powder is applied on affected areas for cooling purpose	35	5	0.14	0.175

					2.Burns 3.Eruptions, Baby rashes, umblicous	2.Powder is mixed with maigi rogin (ghee obtained from Cow, Buffalo and Goat) made into past and applied on burn surfaces 3.Powder is applied on Baby rashes and on umblicous to dry out				
66.	*Nannarrhops ritchieana*	Arecaceae	Kohi peesh	Leaves	Injuries caused due to falling from roofs or from date palm trees	Chopped and mixed with a glass of water, purified water is given and after words three eggs are given to drink Leaves are also used to make shoes, pots and toys	16	2	0.13	0.08
67.	*Nepaeta pretervisa*	Lamiaceae	Simsok	Whole plant	1.Typhoid, 2.Stomachache 3.Antidot	1.Powder mixed with mustard oil and massaged on joints and especially from head to spinal cord as a line 2.Decoction is used 3.After eating a snake cat eats it	32	3	0.09	0.16

68.	*Nerium oleander*	Apocynaceae	Jor	Whole plant	Poisonous and ornamental	Used as poison. Now a days used as ornamental plant	30	2	0.07	0.15
69.	*Nicotiana tabacum*	Solanaceae	Thambak	Leaves	Scorpion sting, Snake bite	Powder is mixed with dumbag-e-rogin (Ghee,ade from fat-tail of sheep) and pasted on affected reas	7	2	0.29	0.035
70.	*Ocimum sanctum*	Lamiaceae	Gwathrope	Seeds Leaves	Eye inflammation 1)Dysentery After diarrhea 2)Hotness of body due to disease	Seven seeds are kept in lower eyelid 1)Ground with a little misri sakar (lump of sugar) to powder and used 2)Chopped leaves are soaked overnight and next day taken herbal bath from infusion	15	3	0.20	0.075
71.	*Olea europaea*	Oleaceae	Hath e tak	Leaves	Skin eruption	Decoction is used	5	1	0.20	0.025

72.	*Onosoma echioides*	Boraginaceae	Yarling	Leaves	Pimples, Eczema	Powder is applied on affected areas	8	2	0.25	0.04
73.	*Oryza sativa*	Poaceae	Brinj	Grain	Tinea versicolor	Grains are washed and the water is used for bath	6	1	0.17	0.03
74.	*Otostegia persica*	Lamiaceae	Guldir	Whole plant	Stomachache, kidney pain, Foot pain, as refregirant	In summer it is soaked in water and in winter its boiled and one cup is used	28	4	0.14	0.14
75.	*Papaver somniferum*	Papaveraceae	Aashash	Seeds	Cough	Decoction is used	11	1	0.09	0.055
76.	*Peganum harmala*	Zygophyllaceae	Ispuntan	Seeds	1.Cephalalgia, allergy 2. For evil eye and evil spirits, Djin	1)Roasted on hot plat and then ground to powder and used orally 2)For evil eye placed in cloth to make charm and worn. For evil spirits and Djinns kept in a piece of a cloth and tied then kept in house	35	4	0.11	0.175
77.	*Pergularia tomentos*	Asclepiadaceae	shither	Whole plant	Removing hairs from sheep and goat skin	To make water skins kept in water along with skins of sheep, goat to remove hairs for several days.	8	1	0.13	0.04

78.	*Pervoskia artiplicifolia*	Lamiaceae	Gwaridaran a	Whole plant	1.Malaria 2.Stomacha che	1.Warmed in a wetted cloth along with little sugar then ground to powder then one tbsp is taken with water 2.In winter its boiled and in summer soaked in water then one cup is drunk	10	2	0.20	0.05
79.	*Phoenix dactylifera*	Arecaceae	Hurmag	Fruit Inflore scence leaflet	Constipatio n Epitaxis Cauterizati on	Eaten early in morning with empty stomach Inhaled at intervals Leaflet is wormed on flam and cauterized affected areas.	19	3	0.16	0.095
80.	*Pimpinella anisum*	Apiaceae	Rezag	Seeds	Typhoid	Made into past and massaged on whole body	12	1	0.08	0.06
81.	*Pistacia khinjuk*	Anacardiac eae	Gwan-e-tak	Leaves	Stomachac he	Decoction is used	14	1	0.07	0.07
82.	*Plantago ciliate*	Plantaginac eae	Danichk	Seeds	Dysentery, Nausea, any severe disease	Mixed with water or curd and taken twice a day if not effective then thrice a day	19	3	0.16	0.095
83.	*Portulaca oleraceae*	Portulacace ae	Chipli	Whole plant	Pot herb	Cooked as curry	10	1	0.10	0.05

84.	*Prunus ebernia*	Rosaceae	Mazhmong	Bark	Cough	One cup of decoction is used	7	1	0.14	0.035
85.	*Prunus persica*	Rosaceae	Halg	Seeds	Pot belly	Two seeds are taken early morning in empty stomach till seven days	5	1	0.20	0.025
86.	*Psammogeton biterntum*	Apiaceae	Isboke	Flower	Fever	Soaked in water and used	17	1	0.06	0.085
87.	*Punica granatum*	Punicaceae	Anar	Fruit pericarp	Mouth rashes, Aphthous ulcer, ulcer	Crushed and powder is applied	15	3	0.20	0.075
88.	*Quercus infectoria oliv*	Fagaceae	Mazg	Fruit	Toothache, carries	Powder is applied on tooth	6	2	0.33	0.03
89.	*Rhazya stricta*	Apocynaceae	Aeshirk	Leaves Root	1.Eye sore, Eye burning due to sun conjunctivitis 2.Sprain, Insect bite	1. In chopped leaves few drops of human milk is squirted and then mixture is placed in a piece of cloth and tightened by a white thread and then squeezed in eyes. 2. Leaves placed in wet cloth, wormed on flam then used as poultice on affected areas. 1. Chopped roots are soaked in water overnight and used early in	27	8	0.30	0.135

					1.Burning sensation 2.Toothache, Carries 3. Diabetes	morning and herbal bath is taken as well 2. Gurgled by decoction 3. One cup of decoction is used twice a day				
90.	*Rheum emodi*	Polygonaceae	Rivind	Stem	Stomachache	Decoction is used	15	1	0.07	0.075
91.	*Ricinus communis*	Euphorbiaceae	Murpad	Fruit Seeds	Constipation Boils	Fruit or powder of fruit is used with water Extracted oil is applied on the boundary of boils for hastening their bursting and healing	19	2	0.11	0.095
92.	*Rosa indica*	Rosaceae	Gulsohr	Petals	Epitaxis	Raw petals are cooked in pure ghee on hot red coils. After cooling down petals are taken out and crushed well, then again mixed with pure ghee and made	8	1	0.13	0.04

						into past and applied in nose with help of little finger				
93.	*Rumex vesicarius*	Polygonaceae	Trushpak	Whole plant	Nausea, salad	Eaten raw	20	2	0.10	0.1
94.	*Salvadora oliodes*	Salvadoraceae	Lolling	Leaves	1). Vermifuge 2). Goat cough, colon, bronchitis, stomach worm of goat	1). Cooked and used 2). Soaked in water and given to goat	23	4	0.17	0.115
95.	*Salvia aegypciae*	Lamiaceae	Mur	Leaves	Skin eruptions, Eczema	Wormed on hot plate than ground to powder and applied on skin	13	2	0.15	0.065
96.	*Salvia bucharica*	Lamiaceae	Gul-e-kakar	Flower	Stomachache	Decoction is used	8	1	0.13	0.04
97.	*Salvia cabulica*	Lamiaceae	Mateta	Whole plant	Stomachache	Decoction is kept under water-skin overnight. One cup of it is used in morning and one cup in evening	7	1	0.14	0.035

98.	*Salvia plebeiam*	Lamiaceae	Kamarkash	Gums	Stomach ache	Powder is used orally with water	12	1	0.08	0.06
99.	*Salvia reuteriana*	Lamiaceae	Morpozho	Whole plant	Body pain, Vomiting	Decoction is used	31	2	0.06	0.155
100.	*Schweinfurthia papilionacea*	Plantaginaceae	Drohund	Leaves	Head refrigerant	Leaves are ground to powder and mixed with oil/ water and applied on head.	9	1	0.11	0.045
101.	*Solanum nigrum*	Solanaceae	Tola angoor	Fruit	Tonsillitis	Eaten raw	19	1	0.05	0.095
102.	*Solanum suratense*	Solanaceae	Kohi batag	Fruit	Jaundice	Fruits are used	8	1	0.13	0.04
103.	*Sonchus oleraceus*	Asteraceae	Halako	Whole plant	Strangury, dysentery, heart burn	Whole plant is eaten	19	3	0.16	0.095
104.	*Suaeda nudiflora*	Chenopodiaceae	Right	Seed, Stem	Cephalalgia, Neck pain	Powder is mixed with local salt. First head and neck are massaged with mustard oil then the powder is sprinkled	7	2	0.29	0.035
105.	*Syzygium aromaticum*	Myrtaceae	Kalampur	Buds	Toothache	Kept in tooth	20	1	0.05	0.1
106.	*Tamarindus indica*	Caesalpiniaceae	Cheechak	Seed Fruit	Chest pain Spice	Powder is used orally with water Soaked in water at night and one cup	8	2	0.25	0.04

107.	*Tamarix galica*	Tamaricaceae	Gazz	Gum Inflorescence	1)Chest pain, cough 2) Mastitis (Goat)	1) Soaked in water at night and one cup is used early in morning 2) Goat breasts are fumigated	5	3	0.60	0.025
108.	*Teomella undulata*	Bigoniaceae	Purpuk	Flower	As refrigerant, burning sensation	Herbal bath is taken	11	1	0.09	0.055
109.	*Tephrosia apollinea*	Papilionaceae	Mathkenk	Whole plant	Measles	Soaked in water and one cup is used in morning and one at night	10	1	0.09	0.05
110.	*Terminalia chebula*	Combretaceae	Syahen halela	Seeds	Stomachache, Constipation	Powder is mixed with pure ghee and taken	8	2	0.25	0.04
111.	*Teucrium stocksianum*	Lamiaceae	Kalporag	Whole plant	Stomachache, vomiting, Diabetes	In summer soaked in water and in winter boiled and one cup of decoction is used	29	3	0.10	0.145
112.	*Typha Angustifolia*	Typhaceae	Kull	Leaves	Itching	Herbal bath is taken	10	1	0.10	0.05
113.	*Trachyspermum ammi*	Apiaceae	Ajwaen	Seeds	Gastric pain, flatulency	One teaspoon seeds are given	14	2	0.14	0.07

114.	*Tribulus terestris*	Zygophyllaceae	gandaboo	Seeds	Constipation	Powder is taken	8	1	0.13	0.04
115.	*Trichodesma Stocksianum*	Boraginaceae	Charmahing	Leaves	Chest pain, cough and cold	Powder is taken orally with water	23	3	0.13	0.115
116.	*Vicia faba*	Fabaceae	Banklenk	Seeds	Gum diseases, Pyorrhea Measles	Kept in tooth Cooked and given	9	3	0.33	0.045
117.	*Withania Coagulans*	Solanaceae	Paneerbad	Fruit	Chest pain, waist pain, Lumbago, itching	Grind with gum and taken in empty stomach before retiring to bed and slept on same side where the pain is	27	4	0.15	0.135
118.	*Withania somnifera*	Solanaceae	Kakink	Stem	Skin eruptions	Skin eruptions decoction is used	5	1	0.20	0.025
119.	*Zataria Multiflora*	Lamiaceae	Isgind	Leaves	1). Cephalalgia, itching 2). Mumps	1)Decoction is used 2)Roasted leaves are pounded and mixed with peera wad (local salt) then cooked in mustard oil till dense, made into paste and pasted on mumps	25	3	0.12	0.125
120.	*Zingiber officinale*	Zingiberaceae	zanjabeel	Rhizome	Cough	Decoction is used	7	1	0.14	0.035

121.	*Ziziphus mauritsana*	Rhamnaceae	Konar	Fruit Root Leaves	Diabetes Mouth rashes and injuries Boils	Finely powdered, sieved and taken twice a day with water Outer cover peeled off, curled and boiled in water and gurgled by decoction Leaves are rubbed on a stone along with a little piece of glass (of a broken cup) to obtain paste which is applied on boils	18	4	0.22	0.09
122.	*Zygophyllum aurantiacum*	Zygophyllaceae	Kirichigwalag	Flowers	1). Stomach ache 2). Heart ache	1) Soaked in water left to stand over-night, one cup infusion is used early in the morning 2) Kept in mouth	22	2	0.09	0.11

powder (25%) followed by decoction (18%) (Fig. 3) and the most common plant part used was leaves (25%) and seed (22%). (fig.4). Highest number of plant species (44 species) are used for curing of gastrointestinal diseases. It is observed that a single plant species is used for the treatment of more than one disease for instance *Caralluma tuberculate (*Stomachache, Blood pressure, Malaria, Diabetes, Heart problems). And it was also observed that different parts of a single species are used for different disease for example *Ziziphus mauritsana (*Fruits for Diabetes, Roots for Mouth rashes and injuries and Leaves for Boils. Eye disorders category had the highest ICF value (0.6). Two species *Chenopodium album* and *Tamarix galica* were recorded having the highest use value (0.6) for each. *Highest RFC value was also* calculated for two species Peganum harmala and Myrtus communis (0.18). Rhazya stricta was calculated as Highest use report with 8 URs following Myrtus communis, Caralluma tuberculate, Commiphora mukul and Allium Cepa with 5 URs each.

Table 2

Family Name	No. of plant species
Lamiaceae	14
Apiaceae	10
Solanaceae	6
Asteraceae	5
Fabaceae	5
Asclepiadaceae	3
Boraginaceae	3
Myrtaceae	3
Poaceae	3
Rosaceae	3
Zygophyllaceae	3

From this study, it was found maximum number of plant species belonging to Lamiaceae family species are used for medicinal purposes. This result is similar with the results of (Demirci and Özhatay 2012, Rajaei and Mohamadi 2012). The present study showed that the women of study area not only rely on native medicinal plants but also have a great knowledge of medicinal plants imported from different areas of country and from Iran, UAE, and Saudi Arabia for example *Bowsellia serrata, Cocculus antiguorum, Commiphora mukul, Myristica fragrans, Rheum emodi, Salvia plebeiam,, Syzygium aromaticum* . One species *Consolida ambigua* is used as Pediculicide to kill head lice. The result of study showed that people

of Panjgur have great believe in Djins, evil spirits, and evil eyes. Two species Peganum harmala and Cocculus antiguorum are used to ward off evil eyes, Jins and evil spirits. This result shows the use of medicinal plants for warding off against evil spirits from other communities of the world as by (Aulakh and Mukerjee 1984, Pieroni 2000, Pieroni and Giusti 2002, Bussmann and Sharon 2006, Das, Dutta et al. 2008). Local people own many domestic animals and use plants for veterinary disease. The present study encountered three species for such purposes which are *Euphorbia helioscopia* as galactagogic for Rabbits, *Salvadora oliodes* for goat cough, vermifuge, *Tamarix galica* for Mastitis of Goat. In different parts of the world, plants are also used for treating veterinary diseases.(Giday, Asfaw et al. 2003, Bekalo, Woodmatas et al. 2009, Tolossa, Debela et al. 2013). Two species *Phoenix dactylifera* and *Nannarrhops ritchieana* are used to make toys, shoes, praying mats, thatching huts.

3.2. Use categories and use reports of the area

Local people use plants for different diseases treatment. These plants are also used for veterinary diseases and spiritual diseases. The use category is divided into 15 broad categories, which are as follow: antidote, blood circularity system disorders, dermatological problems, Ear Nose Throat (ENT) diseases, eye diseases, glandular disorders, gastrointestinal diseases, infectious diseases, Muscoskeletal disorders, neurological disorders, respiratory diseases, urogenital problems, veterinary diseases, warding off against Evil eyes, evil spirit and DJins. However, few ailments like hands and feet burning, obesity (fig. 3). In district Panjgur maximum plant species are used to treat gastrointestinal diseases (45 species). This result shows resembles to the literature available. (Khan, AbdElsalam et al. 2014, Urso, Signorini et al. 2016). Dermatological diseases (24) follow gastrointestinal disease.

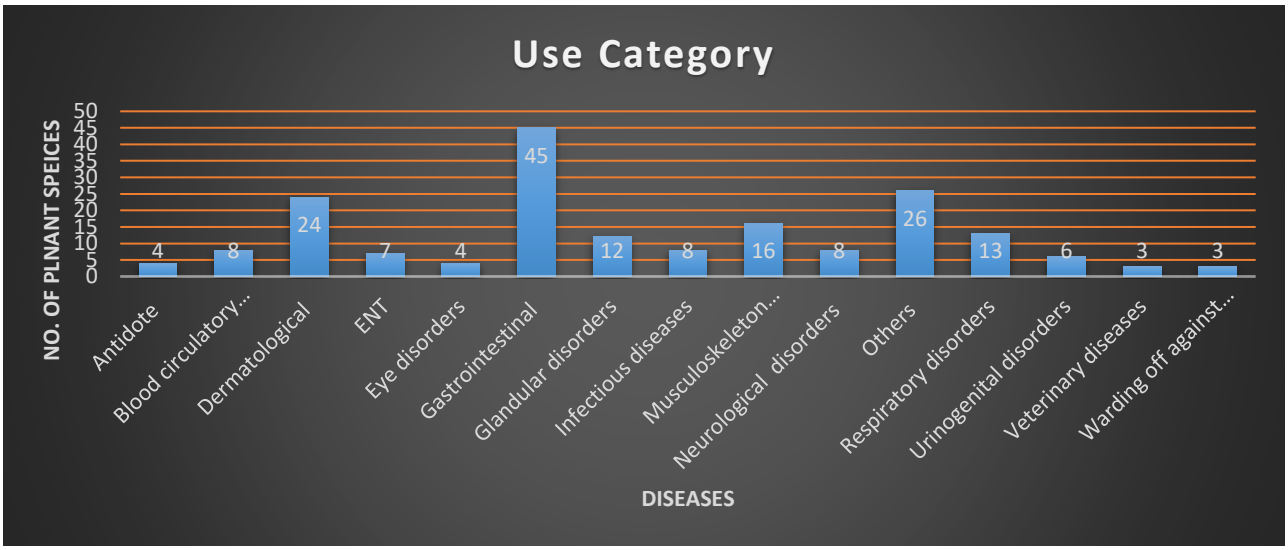


Fig. 3

3.3. Herbal drug preparation methods

In drug preparation method, powder was the most preferable method among the inhabitants, which counts for 22 % with 38 species. Decoction (18 % with 31 species), raw (17 % with 30 species) and infusion (15 % with 26 species) are used along with other methods. (Fig 4). In the study 10 internal application methods were recorded i.e., cooked, decoction, electuary, juice, infusion, mixture, powder, raw, syrup, tea have been used internally. Powder and infusion are also used externally while other external methods were amulets, cauterization, fumigation, gel, extraction, latex, poultice, pulp.

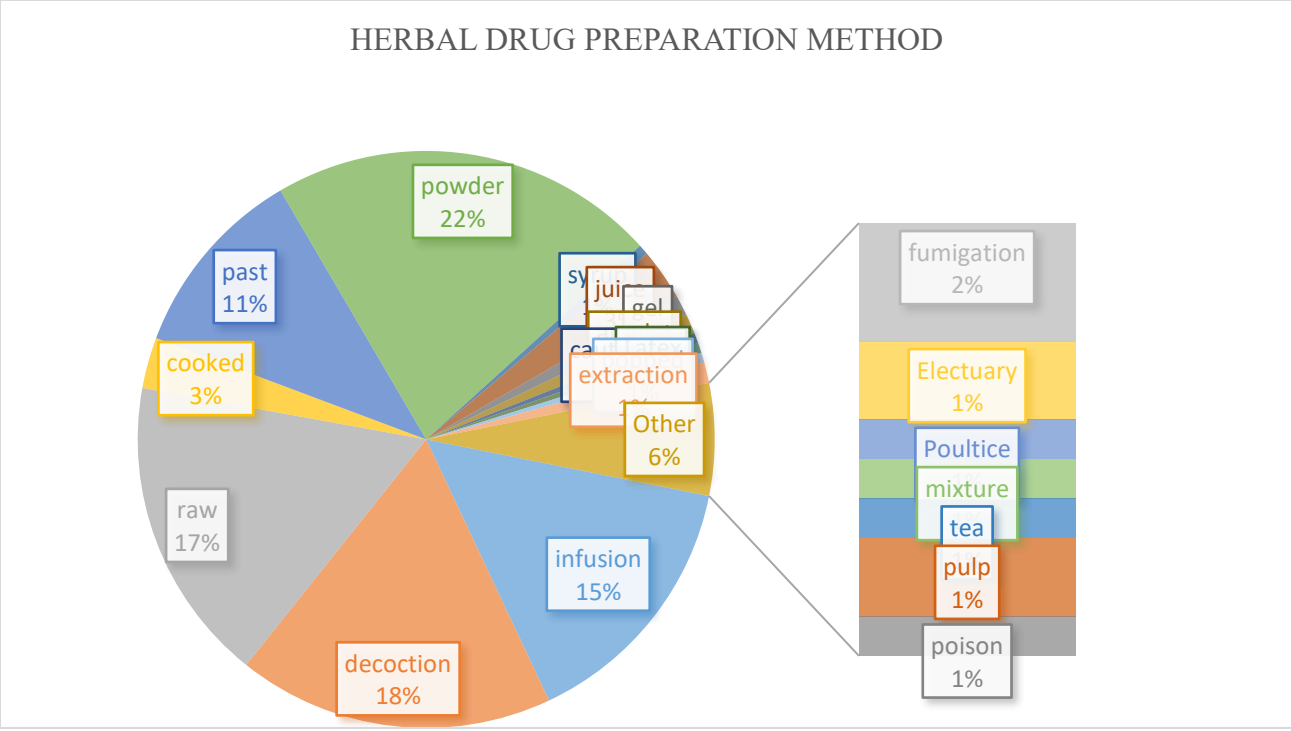


Fig.

3.4. Plant parts used for medicinal purposes

Leaves (25%) are the mostly used part of the plants by the local people followed by seeds (22%) (Fig. 5). As leaves are more abundant form of plant parts than other parts and are easily obtainable, thus making the use more frequent to practitioners. The results agree with (Giday, Asfaw et al. 2003, Ali-Shtayeh, Jamous et al. 2008, Jeruto, Lukhoba et al. 2008, Rajaei and Mohamadi 2012)

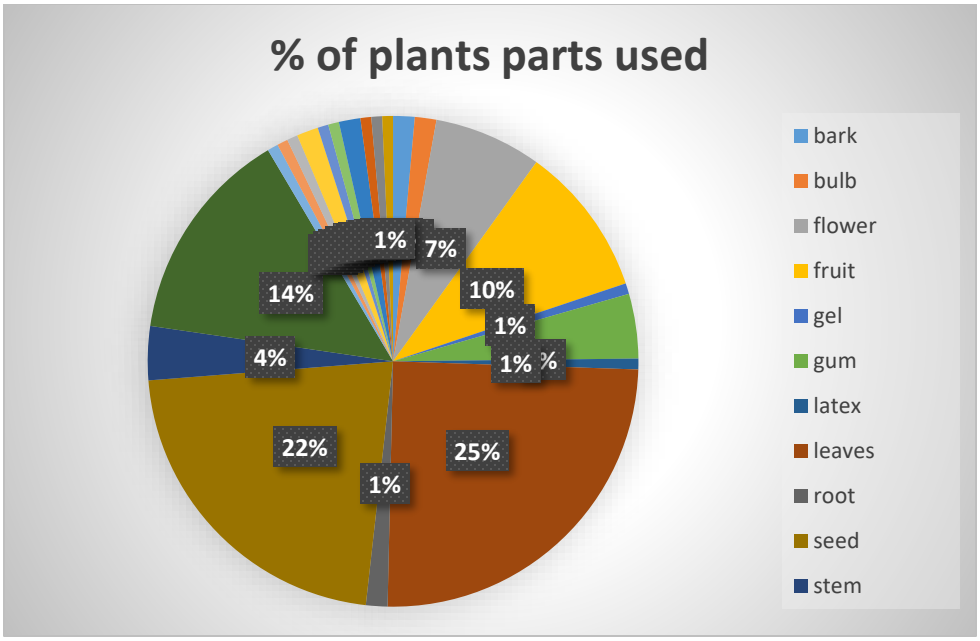


Fig 5

3.6. Quantitative analysis

3.6.1. Informant's consensus factor (ICF)

The informant consensus factor (ICF) of medicinal plants for each disease category was calculated. In this study, the ICF ranges from (0–0.6) (Table 3). The highest ICF value was recorded for Eye disorders, which is 0.6. the result of highest ICF value for eye disorders agrees with the previous result study of ICF value of 0.98 (Hassan-Abdallah, Merito et al. 2013). The second highest ICF value was encountered for Veterinary diseases (0.5). Three disease categories ENT, Infectious diseases and Neurological disorders ranked to the lowest ICF value (0). ENT having the lowest ICF value (0.0)was also mentioned in the research study conducted by T. Bibi et al(2014).

Table 3.

Disease based categories and ICF

Disease Category	No. of use report	% of Use Report	No of Texa	% of texa used	Informant consensus factor ICF
Antidote	5	2	4	2	0.3
Blood circulatory system disorder	10	4	8	4	0.2
Dermatological	36	15	24	13	0.3

ENT	7	3	7	4	0.0
Eye disorders	8	3	4	2	0.6
Gastrointestinal	59	24	45	25	0.2
Glandular disorders	13	5	12	7	0.1
Infectious diseases	8	3	8	4	0.0
Musculoskeleton disorder	26	11	16	9	0.4
Neurological disorders	8	3	8	4	0.0
Others	24	10	22	12	0.1
Respiratory disorders	20	8	13	7	0.4
Urinogenital disorders	8	3	6	3	0.3
Veterinary diseases	5	2	3	2	0.5
Warding off against Evil eye and spirit	4	2	3	2	0.3

3.6.2. Use value (UV), use report (UR) and relative frequency of citation (RFC).

The highest use values were calculated for two species *Chenopodium album* and *Tamarix galica* (0.6) followed by *Allium Cepa* (0.5), *Citrus limon* and *Commiphora mukul* (0.3). The least use values were reported for *Gaillonia aucheri* and *Capsicum annuam* (with 0.03 each).

The highest use report (UR) was found to be for *Rhazya stricta* with eight use reports following *Myrtus communis*, *Caralluma tuberculate*, *Commiphora mukul*, *Allium Cepa* with five(5) use reports each. (Table 1).

Myrtus communis and *Peganum harmala* both ranked Highest RFC value (0.18), and *Nepaeta pretervisa, Capsicum annuam, Salvia reuteriana* ranked second highest RFC value (0.16). Among the lowest RFC value was calculated for 14 species *Cynodon dactylon*, *Hordeum vulgare*, *Morus alba*, *Quercus infectoria*

oliv, *Eucalyptus citriodora, Oryza sativa, Chenopodium album* (0.03 for each) (Table 1). The highest RFC value of *Peganum harmala* shows the great believe in evil eye, evil spirits and Djinns in local area.

3.7. **Threats to medicinal plants and indigenous knowledge in the area**

The medicinal plants of district Panjgur are under great threat due to urbanization, construction of buildings, road, droughts, grazing cutting and climatic changes. Rehabilitation, management and conservation efforts combined with detailed biodiversity must become a part of a plan to ensure the vaiability of this irreplaceable resource.

4. Conclusion

This study reports the first quantitative ethnobotanical information about the indigenous knowledge of medicinal plants practiced in District Panjgur. Local people use medicinal plants for different ailments. The local inhabitants use their own terms for describing diseases like tooth worm medically known as dental carries, heart air medically called dyspepsia, heart worm and lever worm. In the study it was found that the old women have great knowledge of medicinal plants and consider it safe and sound and without any side effect. However, the new generation is more attracted to medical treatment and have less knowledge about the precious knowledge and with the passage of time and loss of older women, this knowledge is being lost. This is recommended further ethnobotanical and ethnopharmacological studies should be carried out in order to preserve this heritage and awareness programs should be conducted.

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