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Ethnomedico Profile of Indigenous flora of Tehsil Barnala, district Bhimber, Pakistan

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Abstract
An ethnomedicinal profile was generated to explore medicinal potential of indigenous plants for of Tehsil Barnala District Bhimber, used against renal disorders. A comprehensive and spatial survey from three locations was conducted by using questionnaire methodology consisting on open-ended and closed-ended interview strategy. A total of 155 informants (70 male and 85 female) were interviewed from local community people and rural hakims (herbalists). The analysis generated checklist of 50 plants which belonged to 35 families. Commonly used plant parts were fruits (26.3%), leave (12.7%) and seeds (16.45%) and frequent usable forms were: tea mixture (26.34%), cold extract (18.73%), decoction (17.1%) and dry powder (13.65%). Informant Consensus Factor (ICF) values in all the three selected localities were; 0.653, 1.256, 0.483 in Malot, Dandar and Kadhala, respectively. Fidelity Level (FL%) of these plant species was also calculated and it was determined that most commonly used plant species against renal problems in these areas are: *Ricinus communis, Rosa damascena, Punica granatum, Zingiber officinale, Zea mays, Daucus carota, Raphanus sativus, Mentha longifolia, Aloe barbadensis, Musa paradisiaca, Phyllanthus emblica* and *Achyranthes aspera.* Phytochemical analysis of different plants was also done in lab for finding out the biochemistry of these plants. Plants of *Punica granatum*, *Datura inoxia*, *Aloe barbadensis*, *Phyllanthus emblica* and *Ricinus communis* were tested for confirmation of terpenoids, tannins, flavonoids, saponins and anthraquinones

Keywords: Ethnomedicinal, Indigenous plants, Barnala, Renal disorders, Phytochemicals

Introduction
Plants and man has immortal relationship since the emergence of life on this planet. Man uses plants for its various needs and requirements. The relationship is acknowledged through the beam of science. Science has many branches which envisage all folk and traditional knowledge of plants and people.

Ethnobotany is the study of relationship between people and the plants of that area. Use of plants as medicine is as old as the history of human being on earth and plants were believed to have some healing powers. Human life on the planet is nothing without the plants and role of plants can't be denied. The term and concept of ethnobotany was coined by Harshberger in 1995 encompassing "the knowledge of aboriginal people of an area about plants and their correlation with each other" [1]. The modern concept of Ethnobotany was given by Aumeeruddy (1996). According to him, it is the science which studies the relationship between given society and its environment and particularly, the plant world [2].

Ethnomedicine is a sub-field of ethnobotany or medical anthropology that deals with the study of traditional medicines: not only those that have relevant written sources (e.g. Traditional Chinese Medicine, Ayurveda), but especially those, whose knowledge and practices have been orally transmitted over the centuries [3]. Ethnomedicines have been used to treat different ailments around the globe since time immemorial. Hitherto, more than 80% population of developing countries relies on herbal prescriptions. Ethnobotany has mega role in herbal therapeutics and novel drug discovery and is becoming important in field of applied conservation projects of social and environmental aspects, i.e. both biodiversity and people [4].

In the scientific era, ethnomedicinal studies are generally characterized by a strong anthropological approach, or by a strong biomedical approach, particularly in drug discovery programs (Ref add). The focus of anthropological studies is the perception and context of use of traditional medicines, while biomedical approaches often focus on discovering therapeutic molecules, such as the anti HIV/AIDS molecule prostratin (Ref add).

Cure of diseases through medicinal plants is always a salient feature of Islamic teachings and preaching. Ethnomedicines provides clue and hints for new drug formation by pharmaceutical analysis and biotechnological instrumentation (Ref add).

Kidneys are vital organs of human body which perform regulatory roles for continuation of life. Renal physiology is the study of kidney function, while nephrology is the medical specialty concerned with kidney diseases. Kidney diseases are diverse spreading due to many pros and cons of anthropological, environmental, physiological and medicinal perspectives. Common clinical conditions involving the kidney include nephritic and nephrotic syndromes, renal cysts, acute kidney injury, chronic kidney disease, urinary tract infection and urinary tract obstruction [5]. Many plants have been used for cure of renal diseases and renal calculi since many years of human history such as *Pinus roxburghii* [6]; *Geranium wallichianum* [7]; *Portulaca oleracea* [8]; *Ceropegia bulbosa* [9]; *Elettaria cardamomum, Emblica officinalis, Ficus religiosa, Mangifera indica, Punica granatum, Santalum album, Terminalia belerica* and *Zingiber officinale* [10].

Barnala is a sub-division of district Bhimber and it is located at 32°58'60 N 74°04'0 E making the most southern point of. This area is guarded by high mountains on northern sides which offer breathtaking and mesmerizing natural scenes to the visitors, waterfalls come down mountain slopes as well as streams of crystal clear waters. The area is buffer zone between Pakistan and other parts of and culturally it is very rich and dynamic because its inhabitants dwell since long time ago and have their roots of family, religious, commercial/trade and ethnic relationships [11].

The area has different ethnic groups residing in plains and hills. The people of this zone belong to different casts such as: Gujars, Jats, Rajpoot, Jarral, Mirza, Syed, Mughal, Arain, Awan, Afhan/Pathan and Sardar [12]. The majority of people religiously belong to Islam and some belong to Christians and other but in minority. The inhabitants' main source of livelihood is agriculture and keeping livestock: animals and poultry but some do have jobs and employment in different departments of government, semi-government organizations and NGOs. A good percentage is also working in foreign for earning life sustenance.

The area has rich biocultural diversity and its phytogeographic importance is very high for local communities and neighboring local markets. This area has never been explored for ethnobotanical purpose with special reference to plants used for renal treatment by local herbal therapeutic recipes and products (Ishtiaq *et al.,* 2007; Adeel *et al.,* 2012). As mostly people of the area belong to rural set up, so their approach to allopathic medicines and modern treatment of such problems is limited due to many constraints such as: cultural barriers, poor economy, strong belief on local treatment that it has no side effects and it is preferably cheaper and easy to obtain [12] (Attaullah *et al*., 2010).

With advent of modern sciences, young generations are least interested in folklore knowledge of herbal medicines. Maximum efforts should be made to document and integrate indigenous knowledge about their about their utilization practice. The population of Pakistan has the understanding of numerous significant medicinal plants of their area. This treasure is transferring to these people from generation to generation by their forefathers. Due to rapid socio-economic and cultural transformation of our modern generation is not known to this valued information of plants. This homegrown treasure is in hazard of being vanished by modern generation. This is an urge need to protect this treasure of plants by recording it in black and white [13; 14]. It worth to state that extensive exploitation at domestic and commercial level has thrilled the plant biodiversity in threaten zone. This creates need to work for conservation of important cultural and biodiversity aspects of the area. Furthermore, knowledge of ethnomedicines documented and preserved will provide history of cultures of the area and also clue for drug development by pharmaceutical analysis [15].

The objectives of the study are multifarious such as: (1) to find out list of plants being used in herbal medical systems particularly for renal disorders cure; (2) to enlist folklore herbal recipes and therapeutics being used for curing renal malfunctioning in the area; (3) to find out biocultural index through using microstatistical tools such as ICF, FL and IBCD, so that biodiversity conservation status of these medicinal plants may be determined; (4) to explore medicinal and commercial potential of indigenous flora (5) to enlist cultural trends and traditional knowledge of the local people in anthro-botanical perspectives and (6) to provide baseline trend by phytochemical exploration of plants in laboratory suggesting recommendations for industry level pharmaceutical analysis.

Materials and method

Study area

Barnala is beautiful area administratively declared as subdivision of District Bhimber, State of, Pakistan. It is located border making buffer zone between Pakistan and territorial region. Geographically, it is located between 32°58'60 N 74°04'0 E. The climatological parameters show that temperature ranges between 5 ºC to 50 ºC and precipitation in the valley is 850 mm/year. Humidity remains high in rainy season with value of 66% [16-17].

Data collection technique

To collect and document ethnobotanical (EB) data of plant species used for kidney disorders cure planned field trips were designed and conducted during year 2012 and 2013. Questionnaire method based structured and semi-structured interview and participatory appraisal (PA) methodologies were employed to find occurrence density of plant taxa used in kidney cure therapeutics and compile EB informations consisting of parts used, mode of applications [18; 12]. Prior to visits to the area boss of different tribes of various remote villages and other concerned herbalists of the area were approached and objectives of study were introduced and cooperation for this research work was solicited. For interviews to collect EB informations both genders equivocally were selected on random basis preferably of 40 years or above age.

Household women as well as farmers, nomadic tribal people and herbalist (hakims) of the area were chosen as respondents. The native language was used by guide boy (translator) to discuss with respondents for easy communication. The interviews were supplemented by direct observations and plant specimen collection. Informants were asked to name plants they knew, and to reveal the uses of the respective species for kidney cure. Informants in company of translator accompanied the researchers to the field to identify and collect plant material from wild area. In cases of illiterate informants, photographs and fresh plant specimens from the field were presented to them and questionnaires were filled from their responses. Data collected from field surveys, interviews and observations were reviewed and all uncompleted responses

were excluded. This left 155 valid respondent's data. The data were compiled in form of matrix and analyzed qualitatively and quantitatively by using microstatistical tools. During the study trips plants specimens were collected and preserved in the field using standard methods proposed by Olorode 1984 [19]. The collected plants were properly identified by a taxonomist comparing with known herbarium specimens, taxonomic literature, manuals and Flora of Pakistan [20-22]. The prepared specimens were placed in the herbarium of Department of Botany, MUST Bhimber Campus for future reference.

Data Analysis

Data on plant species, families, uses, origin, availability, botanical and vernacular names were entered into MS excel worksheet and summarized as proposed by Cook (1995) [23] and Ishtiaq *et al.,* (2010) [24]. The collected data was compared with previous research conducted on the same area or on same topic by using books, e-books and net. The data after review were screened and only verified and reliable informations were retained for further analysis. The reliability of EB work and information was determined by fidelity level (FL), informant consensus factor (ICF), data matrix ranking (DMR) and priority ranking (PR) techniques with Personal Computer [25].

The fidelity level (FL), the percentage of informants claiming the use of a certain plant for the same major purpose, was calculated for the most frequently reported usages or ailments as:

$$FL\ (\%) = \frac{Np}{N} \times 100$$

Where Np is the number of informants that claim a use of a plant species used for a particular purpose/disease, and N is the number of informants that use the plants as a botanic/medicine to fill/treat any given demand/disease [26]. Information consensus factor (ICF) was calculated for each category to identify the agreement of the informants on the reported cure. ICF was calculated by equation and method described by Ishtiaq *et al.,* 2012 [16].

$$ICF = nur\text{-}nt/nur\text{-}1$$

Where Nur= number of use citation in each category and Nt= number of species used. This method is helpful in the selection of plants for further studies in pharmaceutical analysis and other research projects. DMR and PR methods depict population density of tree species and their conservation status in the area.

Phytochemical study

Egwaikhide and Gimba, (2007) protocol was consulted for phytochemical analysis of some plant species [27]. Plants of *Punica granatum* L., *Ricinus communis* L., *Phyllanthus emblica* L., *Datura inoxia* Mill. and *Aloe barbadensis* Mill. were shadow dried at room temperature. Mostly leafy twigs having fruits and flowers were taken. On complete drying, plants were crushed with the help of mortar and pestle. For methanolic extraction methanol and distilled water was added to the powder form of dried plants at 1:3 and placed for 4 days in air tight glass jars in the lab conditions at room temperature. After 4 days filtration of all the plant extracts was carried out. To check bioconstituents of plants further tests were applied for their confirmation.

*Flavonoids:*1 ml extract was taken and diluted NaOH and HCl were added. (Yellow soln. that turns colourless). *Terpenoids:*1 ml extract was mixed with 2 ml of chloroform (CHCl3) and 3 ml of conc. Sulphuric acid (Reddish brown coloration). *Saponins:*2 ml of extract was shaken and then heated to boil. Frothing (small bubbles) appears. *Anthraquinones:* 2 ml extract was boiled with 10% HCl in water bath for few minutes than cool it. Add chloroform and also add few drops of 10% NH3 and heat the mixture (Rose pink colour). *Tannins:*2 ml extract was heated on water bath and few drops of FeCl3 were added (Dark green colour).

Results and discussion

Human being is stewards of the land and that is why he should take some processes which are not drastic to the nature and which are religious based thinking. Basically ethnomedicine is medical belief and practices of indigenous cultures. Life and diseases stand side by side, where there is a life, diseases are bound to exist. Dependence and sustainability of men, women, children and animal life were revolving to exit. Traditional uses of natural plants remedies provide potential indicators for biological activities.

This work was based on uses of ethnomedicinal plants used against kidney problems. The survey data was collected through interviewing 155 respondents which include both gender, all age groups, farmers, and herbalists of the area (Table 1). Ethnomedicinal information through this research comprised of 50 plants belonging to 35 families and the data was compiled according botanical names, vernacular names, parts used, type of recipes used (Table 2 and Fig 1). Family index depicted that plants used against kidney disorders by the people of the study area were from family Apiaceae (8%), Moraceae and Brassicaceae (6%) each and family Poaceae, Euphorbiaceae, Zingiberaceae, Rosaceae, Solanaceae, Chenopodiaceae and Lamiaceae (4%) and these findings are shown in Table 3. Mostly dominant plants in Barnala were *Beta vulgare, Daucus carota, Raphanus sativus, Ricinus communis, Peucedanum graveolens, Zingiber officinale, Mangifera indica, Punica granatum, Pinus roxburghii. Boerhavia diffusa and Phyllanthus emblica.* All plants collected and observed for kidney problems were enlisted in Table 1.

Most of the species were used frequently by the people in all the three selected localities. Although some species are different in each locality yet they were used repeatedly. It was observed that *Zingiber officinale* along *Piper nigrum* and honey is used to treat kidney problems. Similar uses can be seen in work of Ballabh *et al*., (2008) [10] on traditional medicines of Ladakh district. *Boerhavia diffusa* leaf extract was recorded as beneficial in treating renal disorders. Mahmood *et al*., (2011) [17] mentioned in his work that *Boerhavia diffusa* leaf extract is effective in removing kidney stones. Local people of Barnala sub-division used silk decoction and seeds of *Zea mays* in treating kidney stones. Hussain *et al*., (2010) carried out an ethnobotanical survey and reported that stigma of female flower is useful in kidney problems [11].

Resin of *Pinus roxburghii* were used in making different medicines against renal calluli. Similar results were observed by Uniyal *et al*., (2006) [28] during the survey of Chhota Bhangal. Whole plant of *Ajuga bracteosa* was used in herbal medicine against kidney diseases where as Jan *et al*., (2008) [29] mentioned *Ajuga bracteosa* root decoction is most beneficial in treating kidney stones. *Tribulus terrestris* seeds decoction was used by the local people of the study area as

similar results were obtained by Mahmood *et al*., 2011 [17], Majeed *et al*., 2011). During his work they concluded that whole plant of *Tribulus terrestris* in the form of some mixture is used against kidney disease. Leaves of *Bryophyllum pinnatum* were also recorded as useful [17].

It was found that whole plant of *Portulaca oleracea* along with *Chenopodium album* was used as culinary agent by the local people in kidney diseases. Similar work was done by Ishtiaq *et al*., (2007) [31] in Samahni valley and termed whole plant of *Portulaca oleracea* as food medicine. Whole plant of *Beta vulgare* was also enlisted to be beneficial in renal problems. Root decoction, extract of underground stem is much effective (Ahmad *et al*., 2009). Decoction of *Ocimum sanctum* leaves was recorded to be effective by the local people. Mahmood *et al*., (2011) told that Juice of *Ocimum sanctum* leaves along with fruit Juice of *Heliotropium europaeum* is useful for kidney problems [17]. Most common form of usage of plant parts were fruits (26%), seeds (16%) and roots (12%). It is due to easy availability and palatable for usage. Roots are considered as storage of many vital compounds so they are used in extract making (Fig 2). Admixture of different parts was the most prevalent form of usage (26%), followed by extract (19%) and decoction was (12%) used in herbal folklore therapeutics (Fig 3).

Informant Consensus Factor (ICF) was used in the study area against the diseases documented as in Table 3 to show the prevalence reliability of medicinal plants used by the local people. The ICF values gave the idea of people preferences and their knowledge about the medicinal plants and it depicts the prevalence of knowledge on renal diseases and it was highest in Dandar union council area as shown in Table (5) [32].

The fidelity level (FL) data (Table 4) depicts that *Raphanus sativus* was more in herbal treatments (46.62%), followed by *Ricinus communis* (34.37%) and *Punica granatum* (21.87%) and FL is its importance parameter which is trust of people on plant's prescription being used in folklore recipes.

About 35 families related to the 50 plant species are discussed in Table 1 that was used against renal disorders in the study area. Family ranking was done by finding out the percentages and it was recorded that mostly used plants belonged to Family Umbelliferae.

Phytochemical analysis of *Datura alba*, Ricinus *communis, Aloe barbadensis, Phyllanthus emblica* and *Punica granatum* was done in the lab and confirmatory tests were applied to check the presence of terpenoids, flavonoids, tannins, anthraquinones and saponins. Bioconstituents of the tested plants were enlisted in Table 4. This phytochemical analysis shows that the ethnomedicines are very effective in kidney problems. It was also proved that the plant components are being used allopathically in the treatment of disease by making different drugs, these result findings are correlated with past work, (Table 6) [33].

The collected 50 plants belonging to 35 families were shown in the form of family index in figure 1. Family ranking was done by finding out the percentages and it was recorded that mostly used plants belonged to Family Umbelliferae (8%). Plant parts that were believed to be used frequently against kidney problems enlisted with their percentage in figure 2. These results were shown that most commonly used plant part was fruit (26%) by the local people. Because fruits are easy to collect and can be used in fresh forms. Dosage forms of the plants along with their percentages were given in Figure 3. Mixture was used 26%, decoction 12.38%, extract 18.73% and 13.65% used in fresh forms as engulfed (Table).

Table 1: Age and gander characters of local people interviewed

Informants	Age group (Years)		Total interviewed persons
	<45	>65	
Male	35	40	75
Female	27	23	50
Local Healers	08	22	30
Total			155

Table 2: Family Index (%age basis)

S/N	Family	%age
1.	Euphorbiaceae	4
2.	Poaceae	4
3.	Brassicaceae	6
4.	Apiaceae	2
5.	Myrtaceae	2
6.	Musaceae	2
7.	Zingiberaceae	4
8.	Lauraceae	2
9.	Anacardiaceae	2
10.	Punicaceae	2
11.	Santalaceae	2
12.	Combretaceae	2
13.	Rosaceae	4
14.	Solanaceae	4
15.	Asphodelaceae	2
16.	Moraceae	6
17.	Mimosaceae	2
18.	Pinaceae	2
19.	Chenopodiaceae	4
20.	Lamiaceae	4
21.	Meliaceae	2
22.	Apiaceae	8
23.	Crassulaceae	2
24.	Arecaceae	2
25.	Leguminosae	2
26.	Zygophyllaceae	2
27.	Rutaceae	2
28.	Vitaceae	2
29.	Rhamnaceae	2
30.	Cucurbitaceae	2
31.	Portulacaceae	2
32.	Liliaceae	2
33.	Nyctaginaceae	2
34.	Asteraceae	2
35.	Piperaceae	2

Table 3: Ethnomedicinal Plants used against Kidney Problems

S/N	Family	S/N	Botanical Name	Local Name	Status
1.	Euphorbiaceae	1.	*Ricinus communis* L.	Arnoli	Shrub
		2.	*Phyllanthus emblica* L.	Amla	Tree
2.	Poaceae	3.	*Cynodon dactylon* L.	Khabbal ghas	Herb
		4.	*Zea mays* L.	Maize	Herb
3.	Brassicaceae	5.	*Brassica oleracea var. capitate* L.	Cabbage	Herb
		6.	*B. rapa* L.	Turnip	Herb
		7.	*Raphanus sativus* L.	Reddish	Herb
4.	Apiaceae	8.	*Daucus carota* L.	Carrot	Herb

5.	Myrtaceae	9.	*Eugenia jambolana* Lamk.	Jamon	Tree
6.	Musaceae	10.	*Musa balbisiana* L.	Banana	Tree
7.	Zingiberaceae	11.	*Zingiber officinale* Rosc.	Sunth	Herb
		12.	*Elettaria cardamomum* (L.) Maton A.	Illaichi	Shrub
8.	Lauraceae	13.	*Cinnamomum zeylanicum* Maton.	Dar-cheeni	Tree
9.	Anacardiaceae	14.	*Mangifera indica* L.	Mango	Tree
10.	Punicaceae	15.	*Punica granatum* L.	Anar	Shrub
11.	Santalaceae	16.	*Santalum album* L.	Sandal	Tree
12.	Combretaceae	17.	*Terminalia belerica* (Gaertner) Roxb.	Bairha	Tree
13.	Rosaceae	18.	*Rosa damascena* L.	Rose	Shrub
		19.	*Prunus persica* L.	Peach	Tree
14.	Solanaceae	20.	*Datura inoxia* Mill.	Datura	Shrub
		21.	*Solanum surattense* Burm.	Neeli kateli	Shrub
15.	Asphodelaceae	22.	*Aloe barbadensis* Mill.	Aloe vera	Herb
16.	Moraceae	23.	*Ficus palmata* Forsk.	Anjeer	Tree
		24.	*F. religiosa* L.	Peepal	Tree
		25.	*F. bangalensis* L.	Borh	Tree
17.	Mimosaceae	26.	*Acacia arabica* (Lam.) Willd.	Kiker	Tree
18.	Pinaceae	27.	*Pinus roxburghii* Sargent.	Cheer	Tree
19.	Chenopodiaceae	28.	*Chenopodium album* L.	Bathu	Herb
		29.	*Beta vulgare* L.	Beet	Herb
20.	Lamiaceae	30.	*Ajuga bracteosa* Wall.	Kauri boti	Herb
		31.	*Ocimum sanctum* L.	Tulsi	Herb
21.	Meliaceae	32.	*Azadirachta indica* A. Juss.	Neem	Tree
22.	Umbelliferae	33.	*Mentha longifolia* L.	Podina	Herb
		34.	*Ferula asafoetida* L.	Hing	Herb
		35.	*Peucedanum graveolens* L.	Soya	Herb
		36.	*Foeniculum vulgare* L.	Saunf	Herb
23.	Crassulaceae	37.	*Bryophyllum pinnatum* (Lam. Pers.)	Pathar chat	Herb
24.	Arecaceae	38.	*Cocos nucifera* L.	Coconut	Tree
25.	Leguminosae	39.	*Medicago denticulata* Willd.	Maina	Herb
26.	Zygophyllaceae	40.	*Tribulus terrestris* L.	Pakhra	Shrub
27.	Rutaceae	41.	*Citrus medica* L.	Lemon	Shrub
28.	Vitaceae	42.	*Vitis vinifera* L.	Angoor	Herb
29.	Rhamnaceae	43.	*Ziziphus jujuba* Mill.	Jandi	Shrub
30.	Cucurbitaceae	44.	*Cucurbita pepo* L.	Kaddu	Herb
31.	Portulacaceae	45.	*Portulaca oleracea* L.	Kulfa	Herb
32.	Liliaceae	46.	*Allium cepa* L.	Onion	Herb
33.	Nyctaginaceae	47.	*Boerhavia diffusa* L.	Snatti	Herb
34.	Asteraceae	48.	*Taraxacum officinale* L.	Hand	Herb
35.	Piperaceae	49.	*Piper nigrum* L.	Black pepper	Tree
		50.	*Curcuma longa* L.	Long pepper	Tree

Table 4: Fidelity level of dominant plants in study area used for kidney problems (Total Informants=50)

S/N	Sampling sites	Species	Local Names	FL	Therapeutic use	FL% (Np/N)*100
1	B	*Rosa damascena* L.	Rose	4	Kidney Disorders	12.5%
2	A+B+C	*Raphanus sativus* L.	Reddish	13		40.625%
3	B+C	*Daucus carota* L.	Carrot	4		12.5%
4	A+B+ C	*Ricinus communis* L.	Arnoli	11		34.375%
5	C	*Musa paradisiaca* L.	Banana	3		9.357%
6	B+C	*Mangifera indica* L.	Mango	3		9.357%
7	B	*Prunus persica* L.	Peach	2		6.25%
8	A+B	*Punica granatum* L.	Anaar	7		21.875%
9	B	*Phyllanthus emblica* L.	Amla	3		9.357%
10	A+ C	*Ajuga bracteosa* Wall.	Kauri booti	5		15.625%
11	B	*Terminalia belerica* (Gaertner) Roxb.	Bairha	1		3.125%
12	A+B	*Zingiber officinale* Rosc.	Sunth	7		21.875%
13	B	*Mentha longifolia* L.	Podina	3		9.357%
14	B	*Azadirachta indica* A. Juss.	Neem	4		12.5%
15	C	*Chenopodium album* L.	Bathu	2		6.25%
16	C	*Aloe barbadensis* Mill.	Aloe-vera	1		3.125%
17	B	*Datura inoxia* Mill.	Dhatura	2		6.25%
18	B+ C	*Ficus palmata* Forsk.	Angeer	4		12.5%
19	C	*Zea mays* L.	Maize	2		6.25%
20	B	*Acacia arabica* (Lam.) Willd.	Kiker	1		3.125%
21	C	*Cinnamomum zeylanicum* Maton.	Dar-cheeni	2		6.25%
22	A	*Elettaria cardamomum* (L.) Maton A.	Illaichi	2		6.25%
23	B	*Santalum album* L.	Sandal	2		6.25%
24	B	*Eugenia jambolana* Lamk.	Jamon	3		9.375%

25	B	*Foeniculum vulgare* L.	Saunf	3		9.375%
26	A	*Bryophyllum pinnatum* (Lam.) Pers.	Pathar chat	1		3.125%
27	A	*Medicago denticulata* Willd.	Maina	1		3.125%
28	C	*Ficus benghalensis* L.	Bargad	1		3.125%
29	A	*Boerhavia diffusa* L.	Snatti	2		6.25%
30	C	*Piper nigrum* L.	Black pepper	2		6.25%
31	C	*Solanum surattense* Burm.	Neeli kateli	1		3.125%
32	C	*Ferula asafoetida* L.	Hing	1		3.125%

Keywords: A= Malot, B=Dandar, C= Kadhala,

Table 5: Informant Consensus Factor of Disease in the Study Area ICF= (nur-nt/nur-1)

Area	Sampling sites	Category	Species (nt)	%All Species	Use citation (nur)	% use citation	ICF= (nur-nt/nur-1)
Malot	A^1	Kidney diseases	17	14.17%	20	13.33%	0.157
	A^2		9	7.5%	10	6.66%	0.052
	A^3		7	5.8%	10	6.66%	0.333
	A^4		9	7.5%	10	6.66%	0.111
Dandar	B^1		13	10.83%	20	13.33%	0.368
	B^2		7	5.8%	10	6.66%	0.333
	B^3		8	6.67%	10	6.66%	0.222
	B^4		7	5.8%	10	6.66%	0.333
Kadhala	C^1		17	14.17%	20	13.33%	0.157
	C^2		8	6.67%	10	6.66%	0.222
	C^3		9	7.5%	10	6.66%	0.052
	C^4		9	7.5%	10	6.66%	0.052

Table 6: Phytochemical analysis of five different plant species

Plant species	Bioconstituents				
	Terpenoids	Anthraquinones	Tannins	Saponins	Flavonoids
Datura inoxia	–	–	+	+	+
Ricinus communis	+	–	+	–	+
Aloe barbadensis	–	+	+	–	–
Phyllanthus emblica	+	–	+	+	+
Punica granatum	+	–	+	–	+

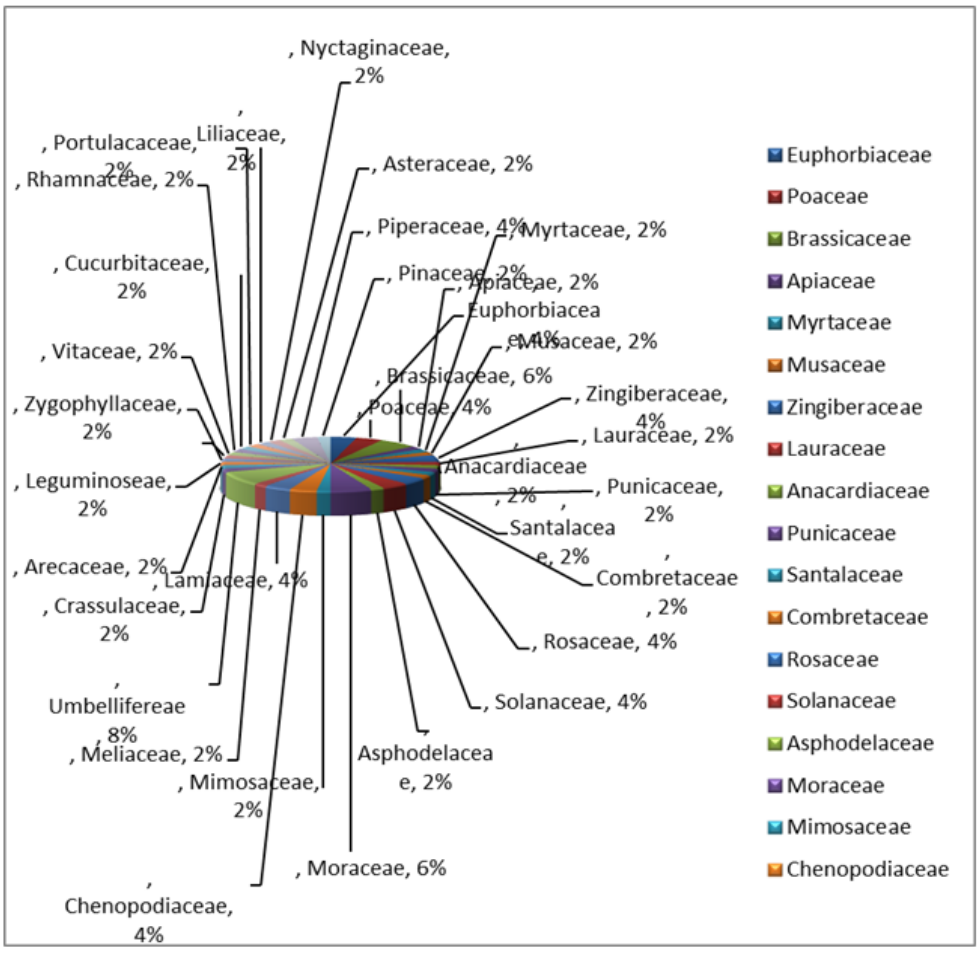

Fig 1: Family Index

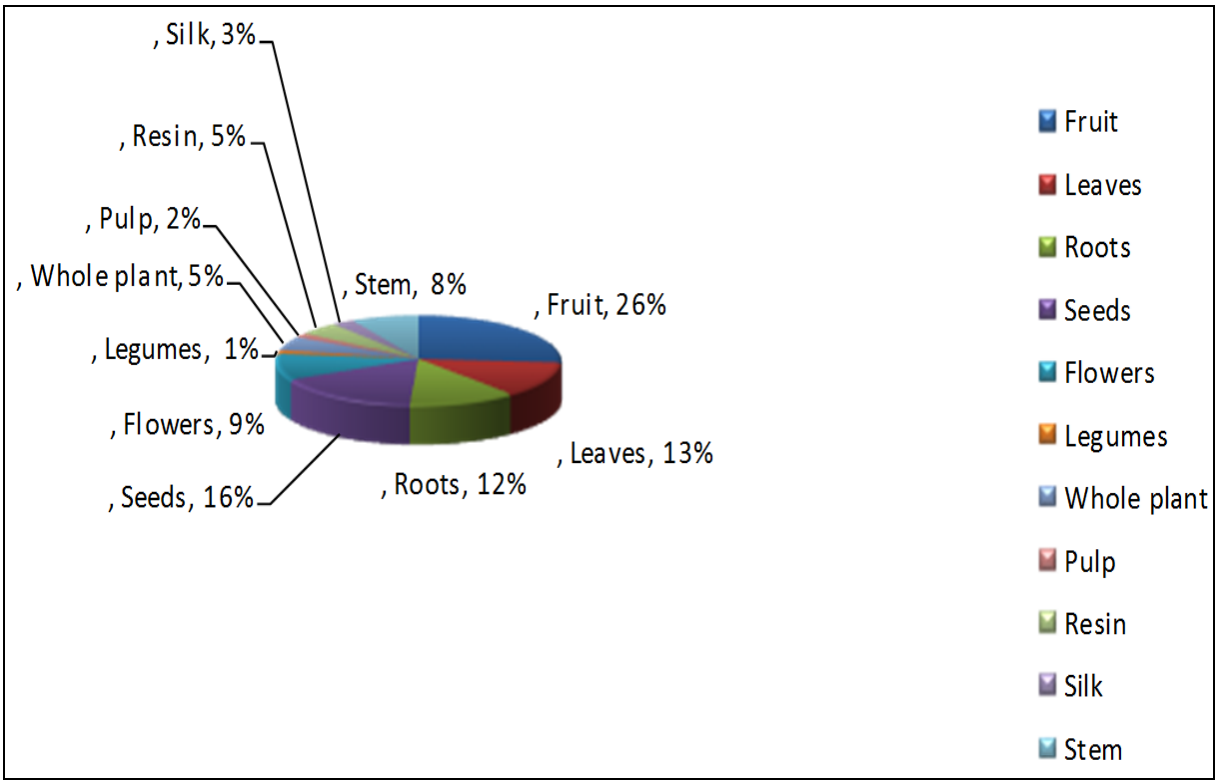

Fig 2: Plants part used

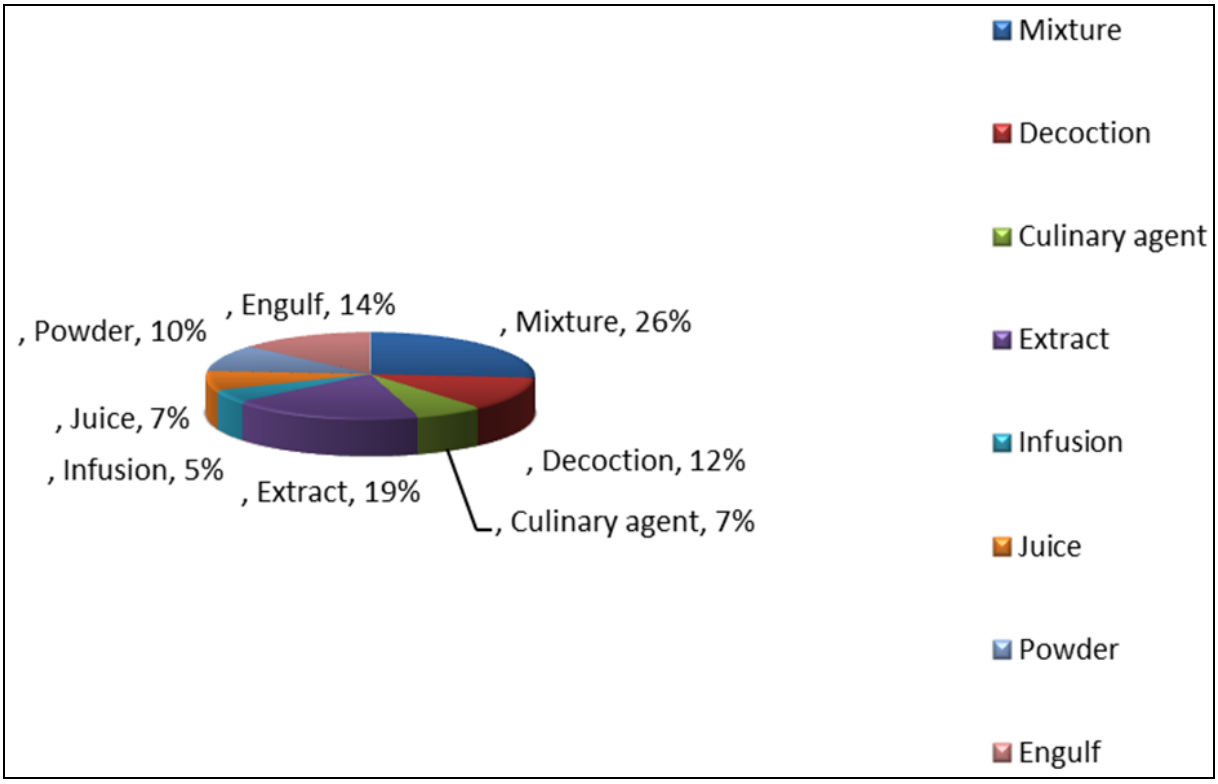

Fig 3: Dosage forms

Conclusion

From present ethnomedicinal study, a total of 50 plants were recorded to be very much effective against kidney disorders. Among these plants *Raphanus sativus*, *Ricinus communis*, *Zingiber officinale*, *Punica granatum*, *Vitis vinefera* were recorded to be used repeatedly on the bases of fidelity level (FL%) values. According to FL%, most dominant species in the study area were *Raphanus satssivus* (40.625%) and *Ricinus communis* (34.375%). It was concluded from the gathered information that people of the study area still relying on herbal treatment against renal disorders. It is also observed that local people of the Bernala prefer fruit (26.3%) as curing kidney problems. Taking medicinal plants in fresh mode is easy and more effective than using allopathic treatment. This ethnomedicinal survey is of immense significance in the study area. Utilization of medicinal plants for health care purposes is of great importance since the prehistoric times. It is need of time to conserve the natural flora from various hazards either natural or artificial. Conservation of these medicinal plants is very important factor in the study area for future perspective.

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