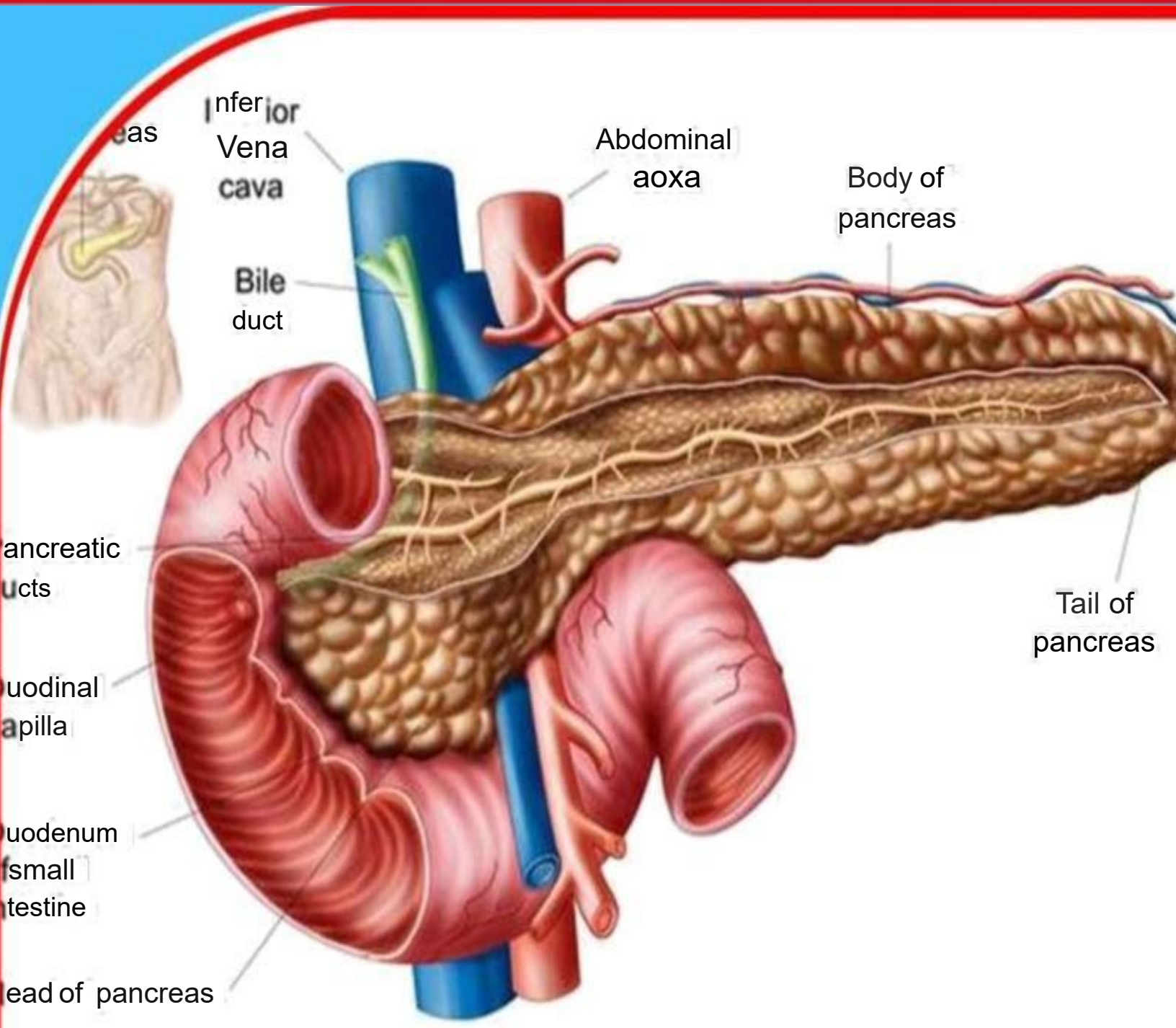

Ethnobotanical study of wild flora of Haroonabad, District Bahawalnagar, Punjab, Pakistan

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Ethnobotanical study of wild flora of Haroonabad, District Bahawalnagar, Punjab, Pakistan

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ABSTRACT

Purpose: The first purpose of this study to record the new and rare use of medicinal plants in the selected area; secondly to discover the plants which were unexplored in the past and thirdly to record the Ethnobotanical data of occurring plant species.

Methodology: The studied area surveyed from July to December. The plants were dried and mounted on standard herbarium sheets. The Ethnobotanical data were collected from 85 local people of Haroonabad by questionnaire.

Findings: The wild flora contained 81 species within 28 families. The largest family was

Poaceae with 15 species followed by Euphorbiaceae with 8 species while Asteraceae and Amaranthaceae with 7 species. The life span of plants was comprised of 47 annual species (58%) and 34 perennial species (42%). The life-form spectrum explains that Therophyte 48 species (59%) were the dominant followed by Phanerophytes 7 species (8%) and Chaemophytes 13 species (17%), Hemicryptophyte 8 species (10%), Geophytes 3 species (4%) Halophyte 1 specie (1%) and Parasite 1 specie (1%). Leaf venation classes of plants consisted of reticulate 28 species (34%), pinnate 29 species (36%), parallel 20 species (25%), palmate 2 species (2.5%) and 2 species (2.5%) were leafless thus had no leaf venation. The plant species with herbaceous stems was 68 while with woody stems 13 species. The Ethnobotanical data of 70 species were recorded because 11 plants were not known by anyone. The range of UV value was 0.09 (*Chrozophora plicata* Vahl.) to 0.78 (*Acacia nilotica* L.) and the RCF value range was 0.03 (*Imperata cylindrica* L.) to 0.95 (*Acacia nilotica* L.). The range of ICF value was recorded from 0.45 (Hormonal disorder) to 0.78 (respiratory disease). 57% whole plant followed by leaves (53%) was used in the ayurvedic field. Therophytes were supported in the studied region for the reason that the region is a semi-arid zone of Punjab, Pakistan.

Unique contribution: The present comprehensive study provides a basic point for other researchers and enhances the knowledge of poor people related to ayurvedic field. The Ethnobotanical study tries to attract the attention towards the conservation strategies of wild plants.

Key words: *Survey, Wild flora, Questionnaire, Side effects, Ethnobotanical study*

Abbreviations: UV, Use Value; RCF, Relative Frequency Citation; ICF, Informant Consensus Factor

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INTRODUCTION

The Ethnobotanical study plays an important role in exposing the relationship between humans and plants [16]. The history of getting medication from the plant is very old. After fulfilling the basic needs like food, fuel shelter and man also uses plants to treat various ailments [13]. In the era we are living in today, 80% of the population is not able to get more expensive treatments. People get medicines from plants to cure their illnesses because herbal medicines are easily available and cheaper than allopathic medicines [1]. There is no doubt that the poor people around the world treat their diseases with herbal medicines. Some plants are specific to the treatment of only one disease and some plants are used to treat many ailments [17]. Ethnobotanical knowledge is now at risk because this knowledge is not transferring from the older generation to the younger generation [2]. The record of the flora of any area by plant taxonomist gain more importance around the world. It provides information about natural vegetation of specific areas [9]. Wild flora in the medicinal field is too much important because, it used in medicinal production and produces immunity in the body to fight against many diseases like cancer, diabetes and heart disease etc. [15]. The purpose of this research to inform the people of developing countries and native people of Haroonabad that wild plants are very important. These wild plants can be used to treat many ailments that are much cheaper than allopathic medicines and their side effects will be much less.

MATERIALS AND METHODS

The whole study area Haroonabad surveyed from July to December. The plants were collected after conducting 15 surveys of the selected area. The plant specimens collected from the area. The specimens were dried and mounted on standard herbarium sheets. The collected specimens were identified with the help of various monographs

{(http://www.ipni.org),
(www.theplantlist.org) and (http://www.ars-grin.gov/cgi-bin/npgs/html/queries.pl)}.

Climate of studied area: The climate in this area is very hot and harsh. Temperature fluctuations are also very high. In the summer, the mean temperature is between 35°C and 60°C and in winter the mean temperature is between 10°C and 20°C. In the desert of Haroonabad, organic matter is very low so it is not considered good soil. The desert is changing into Death Valley due to high temperature, windstorms and a high rate of evaporation. May and June are the warmest months of this area. There are some plants in this area that come out of the ground after rain and die after producing seeds.

Collection of Ethnobotanical data: The total number of participants in the survey was 85 (Male: 51, Female: 34) and they were interviewed by questionnaire. All participants in the survey were between the ages of 37 and 63 years. The eleven percent (9) of the participants was from the homeopathic field and the rest were from different departments like labors, farming, teachers, trading and house-wife.

Table 1: Demographic data of participants

Sr. No.	Variables	Categories	No. of persons	Percentage
1	Gender	Male	51	60
2	Participant profession	Female	34	40
3	Educational background	Hakim	9	11
4	Age	Labor	17	20
		Farming	15	18
		Teachers	13	15
		Trading	19	22
		House-wife	21	25
		Illiterate	0	0
		Middle	31	37
		Matric	17	20
		Intermediate	15	18
		Bachelor	8	9
		Specialization	14	16
		30-40	4	5
		40-50	35	41
		50-60	37	43
		60	9	11

Quantitative analysis of Ethnobotanical data

Use Value (UV): The UV was used to explore the importance of any plant species. According to the formula of Phillips *et al*. (1994), the UV was determined.

$$UV = \Sigma U/n$$

U = No. of participants for a given species n
= Total number of participants

Relative Frequency Citation (RFC): According to Vitalini *et al*. (2013), RFC value was calculated

$$RFC = FC / N$$

FC = Number of participants who points out the use of plant

N = Total number of participants

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Informant Consensus Factor (ICF): According to Heinrich *et al*. (1998), ICF was calculated ICF = {(Nur − Nt) / Nur −1}

Nur = Total number of use informants mentioned for a particular disease category

Nt = Total number of plant species used for a particular disease category

RESULTS

The present study examined the wild flora of Haroonabad, District Bahawalnagar which indicates that the wild flora of this area belongs to 71 species of 28 families. Along with these presented 69 herbs (85%), 5 trees (6%) and 7 shrubs (9%) species by growth habit (Table 4). The most commonly represented family was Poaceae (15 species) followed by Euphorbiaceae (8 species), Asteraceae (7 species) and Amaranthaceae (7 species). *Haloxylon salicornicum* L. and *Cuscuta campestris* Yunk. Were leafless plant species. Annual plants (58%) were more prominent than perennial plants (42%). The studied region supported the Therophytes (59%) and the majority of plants contained the pinnate leaf venation (36%).

The ethnobotanists of Azad Jammu and Kashmir District Kotli collected the 463 plant species belonging to 306 genera and 93 families and reported that the Poaceae family was the dominant among all families [11]. In Pakistan Tolipir National Park, 35 tree species, 19 shrubs, 3 epiphytes, 4 climbers, 75 herbs, 10 ferns, 1 moss and 1 lichen species were recorded. The herbs were dominant in the studied region. The herbs have more importance in the medicinal field due to their high reforestation capacity [5].

Table 3: List of wild flora in Haroonabad, District Bahawalnagar, Pakistan

Sr. No.	Scientific name	Common name	Family	LV	LFS	ST	LS	GH
1	*Trianthema*	Black	Aizoaceae	PIN	Th	Hr		
2	*portulacastrum* L.	pigweed	Aizoaceae	PIN	Th	Hr		
Zaleya pentendra L.		Biskhapra	Amaranthaceae	RCL	Th	W		
3	*Achyranthes aspera* L.	Devil weed	Amaranthaceae	PIN	Ch	Hr	A	H
4	*Alternanthera sessilis* L.	Gandal booti	Amaranthaceae	PIN	Th	Hr		
5	*Amaranthus viridis* L.	jungle cholai	Amaranthaceae	PIN	Ch	Hr	P	H
6	*Aerva javanica (Burm.*	Bui	Amarantheceae	PIN	Ch	Hr	P	H
	f.) Schult.	Tandla	Amarantheceae	LL	Ch	W	P	H
7	*Digera muricata* L.	Lana	Amaranthaceae	RCL	Ha	W	A	H
8	*Haloxylon salicornicum*	Kali lani					P	H
	L.						A	H
9	*Suaeda fruticosa* (L.) Forsk						P	S
							P	S

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Contin……

Sr. No.	Scientific name	Common name	Family	LV	LFS	ST	LS	GH
10	*Calotropis procera*	Aak	Asclepiadaceae	PIN	Ch	W	P	S
11	(Aiton)	Kasni	Asteraceae	PIN	Th	Hr	A	H
12	*Cichorium intybus* L.	Leh	Asteraceae	PIN	Th	Hr	P	H
13	*Cirsium arvense* L.	Horseweed	Asteraceae	RCL	Th	Hr	A	S
14	*Conyza ambigua* L.	False daisy	Asteraceae	RCL	Ch	Hr	P	H
15	*Eclipta alba* L. *Parthenium*	Chatak	Asteraceae	PIN	Th	Hr	A	H
	hysterophorus L.	chandni						
16	*Sonchus asper* L.	Spiny sow thistle	Asteraceae	PIN	Th	Hr	A	H
17	*Sonchus oleraceus* L.	Smooth sow thistle	Asteraceae	RCL	Th	Hr	A	H
18	*Cordia dichotoma* G. Forst	Lasura	Boraginaceae	RCL	Ph	W	P	T
19	*Heliotropium indicum* L.	Oont chara	Boraginaceae	PIN	Th	Hr	A	H
20	*Sisymbrium irio* L.	Jangli sarson	Brassicaceae	RCL	Th	Hr	A	H
21	*Cleome viscose* L.	Hulhul	Capparidaceae	RCL	Th	Hr	A	H
22	*Spergula arvensis* L.	Jangli dhania	Caryophyllacea	RCL	Th	W	A	H
23	*Chenopodium* Worm seed e RCL Th Hr A H *ambrosides* L. Chenopodiaceae							
24	*Chenopodium album* L.	Bathu	PLM	Th	Hr	A	H	
25	*Chenopodium* Jangli bathu Chenopodiaceae RCL Th Hr A H *berlandieri* Moq. Chenopodiaceae							
26	*Chenopodium murale* L.	Krund	RCL	Th	Hr	A	H	
27	*Convolvulus arvensis* L. H	Lehli, baily	Chenopodiaceae	PIN	Th	Hr	P	
28	*Convolvulus* Makro Convolvulaceae PIN Th Hr P H *Pluricaulis* Choisy. Convolvulaceae							
29	*Citrulus Colocynthis* L.	Kor tumma	PIN	He	W	A	H	Cucurbitaceae
30	*Cucumis melo* L.	Musk-melon	RCL	T	Hr	A	H	

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31 H	*Cuscuta campestris* Yunk. Cuscutaceae	Amar bale	Cucurbitaceae	LL	Pa	Hr	A		
32	*Cyperus rotundus* L. Cyperaceae	Chotibhoin,	PAR	Th	Hr	P	H kalooro		
33	*Fimbristylis dichotoma* L.	Coco grass	PAR	He	Hr	P	H		

Contin……

Sr. No.	Scientific name	Common name	Family	LV	LFS	ST	LS	GH
34	*Schoenoplectus mucronatus* L.	Rush booti,	Cyperaceae	PAR	Th	Hr	P	H
35	*Chrozophora Plicata* Vahl.	Giradol	Euphorbiaceae	RCL	Ch	Hr	A	H
36	*Euphorbia granulate* Orteg.	Hazar dani dodhak	Euphorbiaceae	PAR	Th	Hr	A	H
37	*Euphorbia helioscopia* L.	Chhatri dodhak	Euphorbiaceae	PIN	Th	Hr	A	H
38	*Euphorbia hirta* L.	Laldodhak	Euphorbiaceae	RCL	Th	Hr	A	H
39	*Euphorbia microphylla* Heyne ex. Roth.	Nani dudheli, sandmat	Euphorbiaceae	RCL	Th	Hr	A	H
40	*Euphorbia thymifolia* L.	Gulf sandmat						

41	*Phyllanthus maderaspatensis* L.	PIN	Ch	Hr					
42	*Ricinus communis* L.	Arind	Euphorbiaceae	PLM	Ph	W	P	S	
43	*Acacia karoo* Hayne.	Pahari keekar	Fabaceae	PIN	Ph	W	P	S	
44	*Accaia nilotica* L.	Keekar	Fabaceae	PIN	Ph	W	P	T	
45	*Albizia lebbek* L.	Sharin	Fabaceae	RCL	Ph	W	P	T	
46	*Cassia fistula* L.	Amaltas	Fabaceae	RCL	Ph	W	P	T	

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47	Hydrilla verticillata (L.f.) Royle	Jala	Hydrochlorit-aceae	PAR	Th	Hr		P		H
48	*Ocimum Basilicum* L.	Niazboo	Limiacae	PIN	Ch	Hr		A A		H H
49	*Oxalis corniculata* L.	Khati boti	Oxalidaceae	PIN	Th	Hr		A		H
50	*Lathyrus aphaca* L.	Jangli matar	Papilionaceae	RCL	Th	Hr		A		H
51	*Medicago polymorpha* L.	Maina	Papilionaceae	PIN	Th	Hr		P A		T H
52	*Pongamia pinnata* L.	Sukhchain	Paplionaceae	PIN	Ph	W		A		H
53	*Vicia sativa* L.	Revari	Paplionaceae	PIN	Th	Hr		A		H
54	*Phyllanthus niruri* L.	Gulf leaf	Phyllanthaceae	PIN	Ch	Hr	flower	P		H
55	*Avena fatua* L.	Javi	Poaceae	PAR	Th	Hr		A		H
56	*Bromus catharticus* Vahl.	Chawli ghass	Poacea e	PAR	He	Hr				
57	*Brachiaria ramose* L.	Sudan ghass		PAR	Th	Hr				
58	*Cenchrus ciliaris* L.	Dhamasa	Poaceae		PAR	He	Hr	P	H	
59	*Cyanodon dactylon* L.	Khabal ghass	Poacea e	PAR	He	Hr	P	H		
60	*Dactyloctenum aegyptium* L.	Madhana ghass	Poacea e	PAR	Th	Hr	A	H		

Contin……

Sr. No.	Scientific name	Common name	Family	LV	LFS	ST	LS	GH
61	*Demostachya bipinnata* L.	Deep root grass	Poacea e	PAR	He	Hr	P	H
62				PAR	Ch	Hr		
63	*Dichanthium annulatum* Forssk.	Diaz Jungle rice	Poacea e	PAR	Th	Hr	P	H
64							P	H
65	*Echinochloa colona* L.		Poaceae				A	H
66	*Echinochola crusgalli* L.	Barnyard grass	Poacea e	PAR	Th	Hr	A	H
67	*Imperata cylindrica* L.			PAR	Ge	Hr		
	Leptocholoa chinensis L.	Nirm dib Kallar ghass	Poacea e	PAR	Th	Hr	P	H
	Polypogon	Dumb ghass	Poacea e	PAR	Th	Hr	A	H
							A	H

Poaceae46

	monspeliensis L.										
68	*Sachharum benghalense* Retz.	Sarkanda, munj	Poacea e	PAR	He	Hr			P		H
69	*Sorghum halepense* L.	Baru	PAR	He	Hr				P A		H H
70	*Emex spinosa* L. Hr	Trkandi palak	Poacea	Polygonacee	ea	RCL	Th		A		H
71	*Rumex dentatus* L.	Jangli palak	RCL	Ge	Hr						
72	*Portulaca oleracea* L. Hr A H	Qulfa, Lonak	Polygonacea	Portulaceaee				RCL		Th	
73	*Anagallis arvensis* L.	Billi booti	Primulaceae		RCL	Th	Hr	A		H	
74	Renunculus muricatus L.	Ghorr summi	Renunculaceae		RCL	Ge	Hr	P		H	
75	*Dhatura alba* L.	Jimson weed	Solanaceae		RCL	Th	Hr	P	H		
76	*Physalis minima* L.	Rasbari	Solanaceae		RCL	Ch	Hr	A		H	
77	*Solanum nigrum* L.	Mako, Peelak	Solanaceae		RCL	Th	Hr	A		H	
78	*Withania somnifera* L.	Aksin	Solanaceae		PIN	Ch	Hr	P	S		
79	*Sphenoclea zeylanica* Gaertn.	Mirch booti	Sphenocolaceae			PIN	Th	Hr	A		H
80	*Corchorus tridens* L.	Jangli patsan	Tilaceae		PIN	Th	Hr		A		H
81	*Phyla nodiflora* L.	Bukkan-booti	Verbenaceae		PIN	Th	Hr	P		H	

Legends = LV; Leaf Venation, PIN; Pinnate, RCL; Reticulate, LL; Leafless, PAR; Parallel, PLM; Palmate, LFS; Life Form Spectrum, Th; Therophyte, Ph; Phanerophytes, Ge; Geophytes, Ch; Chaemophytes, Pa; Parasite, He; Hemicryptophytes, ST; Stem type, LS; Life Span, GH; Growth Habitat, Hr; Herbacium, W; Woody, A; Annual, P; Perennial, H; Herb, S; Shurb, T; Tree.

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Table 4: Showing the number and percentage of different parameters

Life span

	No. of Species	Percentage		No. of Species	Percentage
Annual	47	58	Perennial	34	42

Life form spectrum

	No. of Species	Percentage		No. of Species	Percentage
Phanerophytes	7	8	Chaemophytes	13	17
Geophytes	3	3	Therophytes	48	59
Hemicryptophytes	8	10	Parasite	1	1

Growth habitat

	No. of Species	Percentage		No. of Species	Percentage		No. of Species	Percentage
Herbs	69	85	Shrubs	7	9	Tree	5	6

Leaf venation

	No. of Species	Percentage		No. of Species	Percentage
Pinnate	29	36	Reticulate	28	34
Parallel	20	25	Palmate	2	2.5

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Stem type

	No. of Species	Percentage		No. of Species	Percentage
Herbaceous	68	84	Woody	13	16

Ethnobotanical data

The Ethnobotanical data of 81 plants were collected from 85 participants through a questionnaire. No one knew the use of 11 plants (*Vicia sativa* L., *Medicago polymorpha* L., *Leptocholoa Chinese* L., *Emox spinosa* L., *Sorghum halepense* L., *Cascuta campestris* Yunk., *Schoenoplectus mucronatus* L., *Phyllanthus maderaspatensis* L., *Corchorus tridens* L., *Dichanthium annulatum* Forsk. and *Bromus catharticus* Vahl.) out of 81. The range of UV value was 0.09 (*Chrozophora plicata* Vahl.) to 0.78 (*Acacia nilotica* L.) and RCF value range was 0.03 (*Imperata cylindrica* L.) to 0.95 (*Acacia nilotica* L.). The highest UV value means a lot of people were used this plant for treatment of ailments. The highest value of RCF means that a lot of people were declared that this (given) plant was useful in ayurvedic field. Residents of the studied area use various processes like juice, infusion, ash, extract, decoction, paste, tea, powder and poultice etc. to prepare a recipe for the cure of different illnesses. While making of decoction, Plant parts were boiled in water until the volume of water reduced to ¼ of original volume. Crude extract was gained by crushing and squeezing of plant parts. Some people were crushed the plant parts and smell it for the treatment of different diseases. Infusion in the ayurvedic field was considered good because bioactive components in plants were not degraded [4]. The majority of recipes were prepared from fresh plant parts [10]. The informants thought that the flowering period was best for plant collection because a lot of bioactive compounds were activated at this stage. The use of seeds and roots in the medicinal field is responsible for the extinction of plants [6].

Informants were aware of the side effects of wild plants as well as their benefits. *Trianthema portulacastrum* L. leaves were also used in a salad but a high dose of leaves also caused the paralysis. *Amaranthus viridis* L. was not toxic itself but if they grow in nitrogenous soil then it showed the toxic effects on consumers. The high dose of *Calotropis gigantean* (L.) W.T.Aiton slowed down the heartbeat and responsible for vomiting. *Conyza ambigua* L. caused the skin allergy after touching the plant. *Parthenium hysterophorus* L. also known as toxic wild plants with few benefits. It disturbed the respiratory system of consumers. The high dose of seeds of *Cleome viscosa* L. enhanced the stomach problem. The high concentration of oxalic acid *Chenopodium berlandieri* Moq. Produced the kidney stone. The high dose of *Convolvulus Pluricaulis* Choisy. Suddenly reduced the blood pressure. According to the informants, great caution was needed in using *Citrullus Colocynthis* L. as even a small dose of it caused the kidney problem, stomach disease and even death. The seed coat of *Ricinus communis* L. contained the poisonous compounds which caused the stomach ailments and high dose of oil can caused the death. The *Acacia nilotica L.* also needed a

lot of caution in using it. It also had some side effects. If it used indiscriminately, it can be caused liver and stomach diseases. The un-ripened fruit of *Solanum nigrum L.* also showed the toxic effect.

According to researchers, the plants of Euphorbiaceae, Fabaceae, Asteraceae and Apocynaceae were considered toxic because majority of plants was contained a saponins, glycosides, steroids, alcohol, cyanogenic glycosides, resins and selenium etc. [3]. Herbs or wild plants were not beneficial or toxic. The use of plants made them beneficial or toxic. The dose of medicines varied from child to old. Dose was taken thrice or twice a day depending upon the nature or situation of patients. The people used the inappropriate techniques for the preparation of medicines which showed the toxic or side effects on the health of consumers [12].

Table 5: Ethnobotanical data of wild flora of selected area

Species name	Part used	Recipes with ailments	UV	RFC

Trianthema portulacastrum L.	Leaves,	Leaves	0.35	0.13
Zaleya pentendra L.	Roots,	*Powder and fresh leaves (odema, dropsy and jaundice)	0.23	0.09
Achyranthes aspera L.	Whole plant	Roots	0.31	0.07
Alternanthera sessilis L.	Leaves,	*Powder (liver, asthma and veneral discharge) Whole plant	0.51	0.23
	Whole plant	*Powder (alcoholic poisoning, veneral discharge, heart disease and piles)		
	Seeds,	Leaves		
	Flowers,	*Juice (stomach problem)		
	Roots,	Whole plant		
	Whole plant	*Powder (urinary infection)		
	Roots,	Seeds		
	Whole plant	*Snake bite Flowers		
		*Rubbed with sugar and made medicine (dog bite)		
		Roots		
		*Powder (stomach, cholera)		
		Leaves		
		*Paste (scorpion bite, insect sting paralysis		
		and nervous system disorder)		
		Whole plant		
		*Powder (washing soda, malaria and cleaning teeth)		
		*Extract (diarrhea, dysentery and skin diseases) Roots		
		*Juice (fever, cold, cough and blood dysentery) Whole plant		
		*Paste (wounds, draw out spines from body and cooling agent)		
		*Baked with corn flour (menstrual disorder and stomach disease)		

			*Dry plant mixed with salt (Stop excess bleeding and blood vomiting)		
Spergula L.	*arvensis*	Seeds	*Making bread	0.14	0.16
		Whole plant	*Tea (inflammatory and lung infection)	0.16	0.09

Chenopodium

ambrosides L. Contin…

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Species name	Part used	Recipes with ailments	UV	RFC
	Leaves,	Leaves	0.33	0.28
	Roots,	*Juice (heart disease and eye wash to prevent infections)	0.15	0.19
	Whole plant	*Powder (inflammation)	0.17	0.21
	Seeds,	Roots	0.19	0.16
	Flowers,	*Juice (inflammation of urinary bladder, constipation and dysentery)	0.42	0.56
	Roots,	Whole plant		
	Leaves	*Powder (soap making)		
	Stems,	Seeds		
	Seeds,	*Boiled seeds (mouth disease)		
	Flowers	Flowers		
	Leaves	*Dry and fresh are used to stop the bleeding and repair the damaged cell.		
Amaranthus viridis L.	Leaves	Roots		
Aerva javanica (Burm. f.) Schult.	Barks, Root, Leaves	*Juice (eye washing)		
Digera Arvensis L.		Leaves		
Haloxylon salicornicum		*Paste (inflammation)		
Suaeda fruticosa (L.) Forsk		Stems		
Calotropis		*Chewing of stem improve the digestive system		
		Seeds		
		*Urinary disorder		
		Flowers		
		*Dry (Urinary disease)		
		Leaves		
		*Tea (minimize the pregnancy pain)		
		*Fresh juice (eye infection)		
		Whole plant		
		*Ash of whole plant (wounds)		
		Leaves		
		*Paste (ringworm infection and skin allergy)		
		Barks		
		*Smoke is inhaled (respiratory disease and asthma)		
gigantean (L.) W.T.Aiton		*Dry powder mix in water (stomach and heart		

problem
Roots
*Ash of dry roots (skin allergy) Leaves
*Leaf juice rubbed on scorpion sting

Contin……

Species name	Part used	Recipes with ailments	UV	RFC
intybus	Leaves,	Leaves and flower	0.34	0.26
Cichorium	Flowers,	*Paste (wounds)	0.16	0.16
L.	Whole plant	Whole plant	0.18	0.14
Cirsium arvense L.	Stems,	*Juice (diarrhea and stomach problem)	0.13	0.24
Conyza ambigua L.	Roots	Stems	0.20	0.31
Eclipta alba L.	Roots,	*Chewing (toothache)	0.11	0.17
Parthenium	Whole plant	Roots	0.23	0.13
hysterophorus L.	Leaves	*Ash (wounds)	0.35	0.47
Sonchus asper L.	Whole plant	Roots		
Sonchus oleraceus	Whole plant	*Root tea (menstrual disorder)		
L.	Leaves	Whole plant		
Cordia dichotoma	Seeds,	*Tea (alcoholic poisoning)		
G. Forst	Barks,	*Paste (piles)		
	Fruits,	*Steam (enhance sneezing during cold)		
	Leaves	*Chewing few leaves daily (eye health)		
		*Extract (high blood pressure)		
		*Decoction (diarrhea, urinary infection, fever and malaria)		
		*Ash (wounds)		
		*Juice (eye disease)		
		*Paste (inflammation)		
		Seeds		
		*Powder apply on skin allergy		
		Barks		

		*Paste (swelling) *Maswak (teeth disease and headache) Fruits *Paste (skin allergy) Leaves *Juice (cooling)		
Heliotropium indicum L. *Chenopodium berlandieri* Moq.	Leaves, Whole plant Whole plant Seeds	Leaves *Infusion (asthma) *Paste (insect sting) Whole plant *Decoction (thrush and diabetes) *Boiled and rubbed on heat rash *Cooked (gout, kidney stone and arthritis) *Powder (making bread with wheat and	0.37 0.30 0.41	0.18 0.47 0.68

Chenopodiastrum		kidney stone		
murale L.				

Species name	**Part used**	**Recipes with ailments**	**UV**	**RFC**
	Leaves,	Leaves	0.59	0.19
	Seeds,	*Infusion (throat and chest infection)	0.22	0.11
	Whole plant	Seeds	0.68	0.87
	Leaves,	*Seed in water (asthma)	0.30	0.47
	Whole plant	Whole plant	0.41	0.68
	Leaves,	*Paste (inflammation) Leaves	0.23	0.12
	Seeds,	*Paste (wounds)		
	Stems,	Whole plant		
	Roots,	*Juice (stimulate the appetite)		
Sisymbrium irio L.	Whole plant	*Decoction (improve the digestive system and enhance hunger)		
Cleome viscosa L.	Whole plant	Leaves		
Chenopodium album L.	Seeds	*Paste (swelling)		
Chenopodium berlandieri Moq.	Flower, Leaves,	Seeds		
Chenopodiastrum murale L.		*Chewing (urinary infection)		
Convolvulus		Stems		
		*Juice (freckles)		
		Roots		
		*Juice (blood dysentery)		
		Whole plant		
		*Decoction (sunstroke and teeth disease)		
		*Cooked (gout, kidney stone and arthritis)		
		*Powder (making bread with wheat and kidney stone		
		Flower		
		*Tea (fever)		

Contin……

arvensis L.

	Whole plant	Leaves		
	Whole plant	*Tea (reduce the excessive menstrual) Whole plant		
	Whole plant			
	Whole plant	*Juice of vine with water (Liver infection) *Decoction with cumin and milk (enhance memory)		
Convolvulus		*Juice (headache)		
Pluricaulis Choisy.		*Powder (high blood pressure)		
Citrullus		*Juice diluted with water (skin infection)	0.45	0.34
Colocynthis L.		*Paste (wound)	0.47	0.39
Chrozophora Plicata Vahl.		*Juice (purification of blood)	0.09	0.03

Contin……

Species name	**Part used**	**Recipes with ailments**	**UV**	**RFC**

Cucumis melo L.	Fruits,	Fruits	0.19	0.25
Cyperus rotundus L.	Seeds,	*Fruit (cooling)	0.14	0.12
Fimbristylis dichotoma L.	Leaves	Seeds	0.16	0.08
Euphorbia granulate Orteg.	Roots, Tubers	*Ground and take with water (improve digestive system) Leaves	0.31	0.25
Euphorbia helioscopia L.	Roots, Leaves	*Fresh or dry leaves are used to release hernias Roots	0.23	0.18
Euphorbia hirta L.	Latex	*Dry Roots (digestive and menstrual problem)	0.45	0.19
	Leaves	*Dry Root mixed with black pepper (stomach problem) Tubers		
	Leaves,	*Dry tuber powder (prevent teeth decay)		
	Stems,	Roots		
	Whole plant	*Crushed roots (aphrodisiac)		
		Leaves		
		*Leaves as a poultice (fever)		
		*Latex purify the blood and externally used on sting bite or scorpion		
		*Extract used for HIV-1 and hepatitis C		
		Leaves		
		*Infusion (asthma)		
		Stems		
		*Infusion (asthma)		
		Whole plant		
		*Paste (sting bite, skin infection, inflammation and fungal infection)		
		*Decoction (foot athletes and fungal infection)		

	Whole plant	*Infusion (asthma)	0.17	0.21
	Leaves,	*Decoction (improve digestive system)	0.19	0.08
Euphorbia microphylla Heyne ex. Roth.	Whole plant	Leaves	0.23	0.09
	Whole plant	*Decoction (kidney disease)		
		*Paste (headache)		
Euphorbia thymifolia L.		Whole plant		
Hydrilla verticillata (L.f.) Royle		*Decoction (diarrhea, lung problem, eye wash and veneral diseases)		
		*Chewing or juice (Nervous system disorder, build blood cells and regeneration of skin)		

Contin……

Species name	**Part used**	**Recipes with ailments**	**UV**	**RFC**

Ricinus communis L.	Fruits	Oil	0.54	0.89
	Stems,	*Castor oil helpful for reducing constipation	0.66	0.93
Acacia karoo Hayne.	Whole plant	when taken by mouth	0.78	0.95
	Leaves,	*Dry eyes cure by castor oil		
Oxalis corniculata L.	Whole plant	*Castor oil removed the dandruff in hair		
	Barks,	*Few drops of castor oil used for better vision		
Accaia nilotica L.	Flowers,	Stems		
	Leaves,	*Extract (loose motion, diarrhea and urinary bladder pain)		
	Seeds,	*Chewing (oral ailment)		
	Whole plant	Whole plant		
		*Whole plant juice used for wound washing		
		Whole plant		
		*Juice (stomach, influenza, urinary disease, insect bite and scurvy		
		Leaves		
		*Juice (insect sting and skin cramps)		
		Barks		
		*Chewing (reduce the teeth lose and stop the bleeding)		
		*Gums (skin irritation, inflammation and		
		Diabetes)		
		*Powder (toothaches)		
		*Boiled with water and wash the wounds		
		Flowers		
		*Fresh (loose motion)		
		Leaves		
		*Juice (eye washing)		
		*Leave (wounds)		
		Seeds		
		*2 gm seeds with warm water (high blood pressure) Whole plant		

		*Decoction (diarrhea)		
Albizia lebbek L.	Barks, Flowers, Seeds, Leaves	Barks *Chewing (diarrhea and piles) Flowers *Paste (skin infection) Seeds *Seeds with mishri (weakness) Leaves *Grind with honey and water (urinary problem)	0.70	0.98

Contin……

Species name	**Part used**	**Recipes with ailments**	**UV**	**RFC**
Cassia fistula L.	Leaves,	Leaves	0.61	0.84
Ocimum	Pods, Barks	*Extract (skin pathogen)	0.45	0.59
Basilicum L.	Leaves,	Pods	0.19	0.09
Lathyrus aphaca L.	Seeds,	*Decoction (malaria, diabetes and kidney stone)	0.44	0.81
pinnata	Whole plant	Bark		
Pongamia	Seeds	*Paste (skin disease)		
L.	Seeds, Leaves, Stems, Roots	*Decoction (washing wounds) Leaves *Juice (Influenza and enhance digestion) *Paste (skin allergy and snake sting) Seeds *Infusion (diarrhea) Whole plant *Juice (digestive and nervous system disorder) *Chewing (teeth diseases) Seed *Oil stomach and liver disease *Paste joint disorder and sores Leaves		

*Decoction (cough)

*Paste (skin infection and stop bleeding)

		Stems		
	Roots, Leaves	*Maswak (Stop spleen enlargement) Roots		
	Seeds	*Juice (ulcer and toothaches)		
	Roots, Whole plant	Roots *Juice (bladder stone)		
	Whole plant	*Infusion (chronic dysentery and cold)		
		Leaves		
		*Infusion (dysentery, stomach problem and cold)		
		*Paste mixed with salt (wounds)		
niruri		*Seeds are used as a cereal for nourishment		
Phyllanthus		Roots		
L.		*Paste (kidney pain)		
Avena fatua L.		Whole plant	0.18	0.08
Brachiaria ramose		*Ash(insect sting)	0.30	0.45
L.		*Juice (kidney problem and tumor)	0.23	0.18
Cenchrus ciliaris L.		*Paste (wound)	0.15	0.12

Contin……

Species name	**Part used**	**Recipes with ailments**	**UV**	**RFC**

Cyanodon dactylon L.	Leaves, Whole plant	Leaves	0.37	0.15
Dactyloctenum aegyptium L.	Leaves	*Paste (wound)	0.29	0.17
Demostachya bipinnata L.	Whole plant	Whole plant	0.12	0.14
Echinochloa colona L.	Stems	*Decoction (cancer, cough, headache, dropsy, stone, snake sting, wound and toothaches)	0.16	0.13
Echinochola crusgalli L.	Roots	*Infusion (accelerate childbirth)	0.18	0.07
Imperata cylindrica L.	Flowers, Roots, Whole plant	*Decoction (dysentery)	0.10	0.03
	Whole plant	*Decoction (dysentery)	0.23	0.05
		*Paste (wounds)		
		*Paste (wounds)		
		Flowers		
		*Paste (wound)s		
		*Decoction (urinary infection and fever)		
		Roots		
		*Decoction (digestive system diseases)		
		Whole plant		
		*Extract (cancer)		
		*Infusion (heart problem)		

Polypogon monspeliensis L.	Leaves, Stems	Leaves *Juice (eye wash)	0.15 0.22	0.17 0.23
Sachharum benghalense Retz.	Roots, Leaves, Stems	*Decoction (urinary infection)	0.34	0.25
Rumex dentatus L.	Whole plant	*Juice (sore throat)		
Portulaca oleracea L.	Leaves Whole plant	Roots *Decoction (stomach problem and intestinal parasite *Paste (swelling)		
		Leaves *Juice (headache) *Paste (wounds)		
		Whole plant *Decoction (reduce body pain)		
		Leaves *Juice (heart disease, cough and earaches) *Tea (stomach disease and headache)		
		Whole plant *Extract (muscle relaxation and wounds)		
		*Juice (skin diseases and insect bite)		

Contin…… Species name

	Part used	**Recipes with ailments**	**UV**	**RFC**
Anagallis arvensis L.	Whole plant	*Infusion (skin diseases and liver diseases) *Paste (skin itches and warts)	0.16	0.16
	Fruits	*Fresh or juice (asthma and fever)	0.28	0.26
Renunculus muricatus L.	Leaves, Seeds	Leaves	0.10	0.04
Dhatura alba L.		*Paste of roasted leaves (reduce full body pain) *Smoke (asthma) *Juice (ear disease) Seeds		

		*Oil (stimulate hair growth)		
	Fruits,	Fruits	0.21	0.14
Physalis minima L.				
	Leaves, Leaves	*Fresh (enhance appetite) Roots,		
	whole plant	*Paste (headache and skin rash)		
		Roots		
		*Extract (fever)		
		*Decoction (diabetes)		

		Whole plant *Extract (cancer)		
	Whole plant	*Juice (tiredness. High sugar level in blood		
Withania somnifera		and high cholesterol level)		
L.		Fruits	0.47	0.57
Solanum nigrum L.	Fruits,	Whole plant *Juice (teeth diseases)		
		*Fresh (eye disease and fever)		
		*Paste (headaches and skin allergy) Whole plant		
		*Paste (wounds)		
	Leaves	*Paste (sting of poisonous animals)	0.17	0.19
Sphenoclea				
zeylanicaPhyla nodif Gaertn.*lora* L.		Leaves,Whole pla nt	Leaves	
	0.22	0.33		
		*3-4 fresh leaves (piles)		
		*Paste (infected skin by ulcer)		
		Whole plant		
		*Whole plant juice (cough and fever)		

Part used: The Ethnobotanical data related to part used of 70 species was displayed because 11 plant species had no Ethnobotanical data and 57% whole plant was used in the ayurvedic field followed by leaves (53%) and roots (26%). According to the data cited by the informants, the %age of using pods (*Cassia fistula* L.), tubers (*Cyperus rotundus* L.) and latex (*Euphorbia granulate* Orteg.) was minimal because they were used only by one plant. The use of leaves other than other plant plants in the medicinal field was good because leaves are easily collected and sustainable method in ecology with no fear of extinction [7].

Table 6: Percentage of plant part used

Part used	No. of Species	Percentage	Part used	No. of Species	Percentage

Leaves	37	53	Roots	18	26
Seeds	16	23	Fruits	6	8
Flowers	8	11	Stems	8	11
Barks	5	7	Whole plant	40	57

Informant consensus factor (ICF): ICF was used to focus on the consistency of data related to particular disease categories. The disease was divided into 15 categories based on the recorded ailments by participants. The range of ICF was recorded from 0.45 to 0.78. The lowest ICF value was observed in hormonal disorder (0.45) and the highest value was shown by respiratory disease (0.78). The highest ICF value predicts that the high %age of participants was used plants for an illness of a comprehensive category. The local people of Haroonabad were used *Euphorbia helioscopia* L. leaves to cure HIV and hepatitis C and *Withiana somnifera* L. was used to treat the high sugar and cholesterol level. The leaves of *Oxalis corniculata* L. were used to treat the scurvy ailment and *Cynodon dactylon* L. was used in cancer treatment.

Table 7: ICF of recorded plant species with respect to different ailments.

Sr.	Disease category	No. of use reports	Percentage use reports	No. of species	Percentage of use species	
No.	Respiratory diseases	41	48	10	12	0.78
1	Nervous system disorder	7	8	4	5	0.50
2	Skin infection	61	72	24	30	0.61
3	Urinary diseases	19	22	10	12	0.50
4	Hormonal disorder	10	12	6	7	0.45
5	Heart diseases	11	13	5	6	0.60
6	Digestive system	17	20	9	11	0.50
7	diseases Stomach diseases Liver diseases	43	51	11	14	0.76
8	Wounds	15	18	3	3	0.85
9	Insect sting	70	82	18	22	0.75
10	Muscle disorder	31	36	11	14	0.67
11	Stone	13	15	3	3	0.83
12	Diabetes	27	32	7	9	0.77
13	Eye, ear, throat and	9	11	4	5	0.63
14	mouth disease	29	34	13	16	0.57

CONCLUSION

The biodiversity of any area indicates the importance of the area. Poaceae and Therophyte species were more prominent in the study area. Wild flora maintains the ecosystem and sustainability in the environment and they also had a major role in the medical field. Present research discovered the medicinal plants that mostly used by local inhabitants to cure various ailments. It tries to attract the attention towards the conservation policy of wild plants. The wild plants in Haroonabad have very importance in the homeopathic medical field but biodiversity was not high.

RECOMMENDATIONS

1. The native people of studied region have used traditional botanical knowledge to heal the various ailments but the accessibility of plants is atypical. Consequently, the traditional healers and the native people should be awake on how to use plants for a variety of objectives and the traditional healers should cultivate some plants in their home gardens.
2. There are some medicinal plants used to treat different diseases. But the chemical components of these plants are not well known. Therefore, research on chemical analysis of these plants should be performed.
3. There is a need to authorize the indigenous communities and make sure their active participation in sustainable harvesting and conservation of natural resources. Different universities should collaborate with indigenous communities and recognize them as 'knowledge site' on a particular subject to uphold their status and conserve its knowledge.

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