

Ethnobotanical Study of Medicinal Plants Around Akbarabad Village in Kavar District, Fars Province, Iran

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Research Article

ABSTRACT

Received: 04-Apr-2022,
Manuscript No. JBS-22-59620;
Editor assigned: 06-Apr-2022,
Pre QC No. JBS-22-59620 (PQ);
Reviewed: 20-Apr-2022, QC
No. JBS-22-59620; **Revised:**
02-Jun-2022, Manuscript No.
JBS-22-59620 (R); **Published:**
14-Jun-2022, DOI: 10.4172/
2320-0189.11.6.012

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Keywords: Ethnobotany;
Medicinal plants; Akbarabad
village; Kavar district; Fars
Province; Iran

Aim of the study: Ethnobotanical knowledge of medicinal plants is a part of any culture and plays an important role in health care system of local communities. Documentation of these information does not only preserve the traditional knowledge of local medicinal plants but also using these information by pharmaceutical industries, may lead to the discoveries of new drugs to be used against some incurable diseases. This study is the first report on native medicinal plants grown around Akbarabad village in Kavar district, Fars Province, Iran.

Materials and methods: The ethnobotanical survey was carried out to collect information of medicinal plants from local people living in Akbarabad village. To collect the information about local medicinal plants, semi-structured questionnaires and open-ended conversations were used to interview nineteen elderly villagers with the age ranging from 48 to 78 years. Medicinal plants were collected during November 2011 to September 2012 and information such as elevation, longitude, latitude, kind of slope, etc, was recorded. Medicinal plants were identified by identification keys. The data were analyzed using quantitative value indices, FIC, RFC and CI.

Result: In this survey, 72 species belonging to 33 families and 64 genera which are used by Akbarabad villagers to treat various ailments. Asteraceae with 11 species was the largest family. Most of the medicinal plants (68%) are used for the treatment of gastrointestinal diseases. Medicinal plants are often used as decoction (40%). Plants leaves are the most common parts being used. These plants are either wild (76.3%) or implants (23.7%). The Majority (80.5%) of medicinal plants are herbaceous species. *Glycyrrhiza glabra*, *Achillea santolinoides*, *Artemisia sieberi* and *Ferula assa-foetida*, has the largest virtue of Relative Frequency of Citation (RFC) index. *Zataria multiflora* has the largest value of Cultural Importance (CI) index. Respiratory disorders have the largest value of

Informant consensus factor (FIC=0.810).

Conclusion: The diversity of medicinal plants and the broad knowledge of indigenous people about these plants indicate a rich ethnobotanical knowledge of such plants around Akbarabad village which can furnish valuable research tools in discovering new drugs in pharmaceutical industry. Mismanagement and excessive harvesting of medicinal plants are important risk factors for the protection of these valuable plants.

INTRODUCTION

From the very distant past, the important roles that plants have played in all aspects of human life are quite apparent. It goes without saying that medicinal plants have contributed tremendously in treating various diseases and in keeping healthy society throughout history. In fact, what we know as a culture is the native knowledge that humans have gained over the thousands of years through communication with each other and with the surrounding nature. Iranian much longer than others has been dealing with medicinal plants and their therapeutic applications. According to the report of world health organization, of total number 8000 plant species that were recorded of Iran, 2500 plants species are being used for medical purpose [1]. In Iran because of society conditions such as assimilating tribes and loss of traditional community life and environmental conditions such as destructive harvesting, urbanization, over-harvesting of natural resources, drought conditions and expanding agriculture, Therefore, it seems necessity ethnobotanical studies to record all the knowledge of folk medicine practiced among indigenous people [2]. In Iran ethnobotany study for the first time was conducted in the Turkaman Sahra [3]. In Fars province (Javidsht, 2001), represented recorded 483 species of medicinal plants and in recent years in different area of Fars province [4,5].

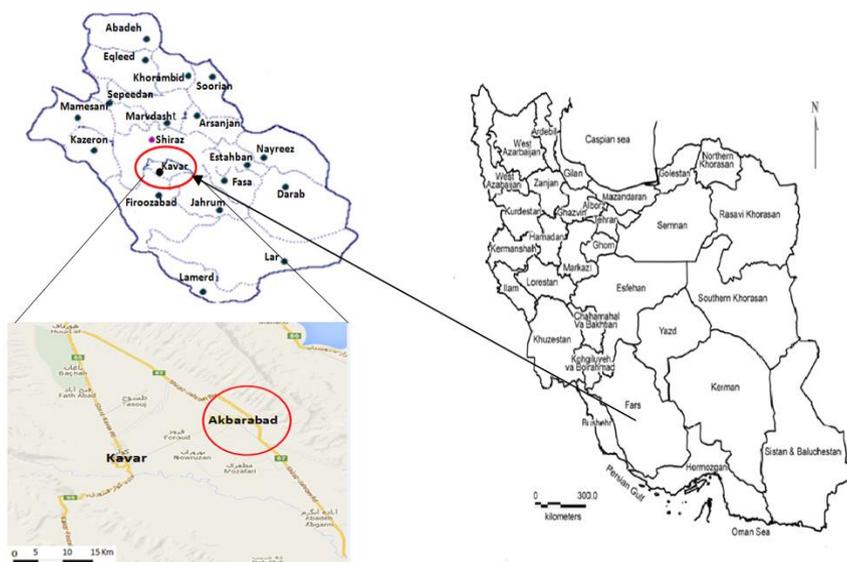
Kavar district with an area of 1650 km² has central status in Fars province. This district is located between two mountain ranges which are the continuation of Zagros Mountains and are separated from each other by 15 kilometers. Peraspid with altitude of 3200 m above sea level is the highest peak in this district. Enjoyment of cold and hot air currents and special orientation of mountains has created diversity vegetation from the semi-forest to steppe. With aim proper use of renewable resources, maintenance of valuable genetic treasures, rare and endemic species introduced recorded 72 species of medicinal plants in Kavar district. In attention that this ethnobotanical study is carried out for the first time in Akbarabad and Kavar district, the aim of this study was to preserve precious knowledge about local use of medicinal plants, implementation of management plans for conservation and sustainable use of medicinal plants, and provides baseline data for more investigation in phytochemistry and pharmaceutical industry. Moreover we applied some quantitative indices (CI, RFC, ICF) to represent importance and popular medicinal plants in Akbarabad and comparing with studies from other regions of Iran, in addition answer to this question that why a large number of herbs are used in the treatment of digestive and respiratory diseases, and in contrast to a small number of herbs used in the treatment of diseases such as allergies. The population of this village is about 7000. This population is made of five tribe (Baghoni, Gonaki, Khajeh, Klydari, Pasaki), and each of these tribes belongs to different regions and cultures. Most of the data presented in this study have been collected from Baghoni tribe. This tribe is part of the great Bureki tribe that migrated to Kavar district about four centuries ago [6]. Baghoni tribe was nomad in Kavar district and settled in current place of Akbarabad about 150 years ago. People of Akbarabad village speak Persian. In the past, the inhabitants were mainly engaged in agriculture and animal husbandry. Today, people life styles have changed and they are no longer interested in agricultural practices. In the past medicinal plants played a major role in health care system of Akbarabad village, particular in common diseases such as gastrointestinal and respiratory diseases. Nowadays, the use of medicinal plants is supplemented with synthetic drugs. In some cases, experience of local people shown that medicinal plants such as *Ducrosia anethifolia* that is used to treat nosebleed and hyperlipidemia are more effective than synthesis drugs. Today, plants are being used for medicinal purposes whereas in the past they have also been used for building, crafts, paint, detergents, fuels, etc [7-15].

MATERIALS AND METHODS

Study area

Geographically, Akbarabad village is located at 52°46'37" E and 29°14'54"N in east of Kavar district and elevation of 1475 m above sea level. Akbarabad village has a Mediterranean climate with warm summers and mild winters [16-20]. The coldest and the warmest months of the year are January and July respectively. Mean annual temperature is 27 °C and the mean annual rainfall is 300 mm [21-25]. The only river running in this district is called Gharhaghaj (Figure 1). Akbarabad village is located in the Irano-Turanian region. The type of vegetation around Akbarabad village is mainly steppe and two species of *Artemisia sieberi* and *Astragalus fasiculifolius* are the dominant vegetation. The soil of this area is very fertile and agriculture in this district is thriving [26-29].

Figure 1. Map of Iran showing study area.



Data collection

Ethnobotanical data were collected from Akbarabad village inhabitants. Nineteen (3 men and 16 women) people with the age range between 48 –78 years were interviewed. Among the interviewees, one was a so called herbal practitioner and the rest were among knowledgeable village inhabitants such as shepherds, farmers, herbalists and housewives. For interview, semi-structured questionnaires and open-ended conversations at villager’s homes were used. Information about the medicinal properties, consumable plants parts, methods of preparation were among the questions asked (Table1). All the information was recorded in the database.

Collection and identification

Collection of medicinal plants was carried out from October 2011 to September 2012 with the help of local people who were familiar with the region medicinal plants. For identification, plants were collected at the flowering, fruiting or both stages. Sites of medicinal plants collection were around Akbarabad village, Badamestan mount, Kheznabi mount, Labard mount, and Kharbareh mount. Voucher samples were also collected for each plant. Plants were identified at the species level by using Flora Iranica and Flora of Iran and then checked with Voucher samples were labeled and then were deposited in Shiraz University Herbarium [30-35].

Data analysis

Quantitative analysis of data was employed to better understand the cultural importance and the pattern of plants knowledge used by local people. In this paper, data were analyzed using quantitative indices FIC, RFC and CI (Tables 1 and 2).

Table 1. Medicinal plants species of Akbarabad village, Kavar district in Fars Province.

No	Family	Scientific name	Local name	Plant parts Used/ Number Use-report	Medicinal uses/ Number Use-report	Preparati on mode (s)/ Number Use-report	Other applications	Vouch er number
1	Apiaceae	<i>Anethum graveolens</i> L.	Shved	Leaves (20) and stem (12)	Hyperlipidemia (11) and nervous disorders (1), with a warm nature?	Aromatic water (12)	Vegetable soup	168
2	Apiaceae	<i>Ducrosia anethifolia</i> Boiss.	Alaf gholamhos sen khani	Leaves (20) and stem	Nose bleed (8), body aches (4), bloating (4) and hyperlipidemia (4), with a warm nature?	Raw (12) /smoke (8)	Edible	182

				(8)				
3	Apiaceae	<i>Echinophora platyloba</i> DC.	Kharghalmeh	Aerial parts (17)	Body aches (7), tooth ache (1), kidney stones (2), female disease (1), jaundice (1), cold (1) general infection (3), and bloating (1), with a warm nature?	Decoction (14) / aromatic water (3)	Spice	12
4	Apiaceae	<i>Eryngium bungei</i> Boiss.	Kharzool	Aerial parts (16)	Cold (2), jaundice (6), nose bleed (2), kidney stones (2), general infection (1) and skin disease (3), with a cool nature?	Decoction (3)/ aromatic Water (13)	Stem edible	198
5	Apiaceae	<i>Ferula assafoetida</i> L.	Anghazeh	Stem (20), leaves (20), and gum (16)	Cold (1), diarrhea (1), acidify (11) gastrointestinal parasites (5), and joint pain (back and leg) (3), with a warm nature?	Steamed (20)/ Powder (21),	Edible	246
6	Apiaceae	<i>Foeniculum vulgare</i> Mill.	Rajoneh	Seed (14)	Nervous disorders (4), and acidify (10), with a cool nature?	Powder (14)	Spice	176
7	Asteraceae	<i>Achillea santolinoides</i> Lag.	Sarzardo	Aerial parts (24)	Stomach ache (15), winner of bile (1), acidify (2), female reproductive infection (2), osteoporosis (1), bruise (2), and hyperlipidemia (1), with a warm nature?	Decoction (22)/ poultice (2)/ aromatic water (22)		140
8	Asteraceae	<i>Artemisia sieberi</i> Besser	Drmneh	Aerial parts (24)	Backache (2), winner of bile (4), acidify (1), stomach ache (14), body aches (1), and jaundice (2), with a warm nature?	Soaking in water(7) / decoction (17)		11
9	Asteraceae	<i>Carthamus oxyacantha</i> M. Bieb.	Zel	Young leaves (2)	Laxative (1), flatulence (1), with a cool nature?	Raw (2) and steamed (2)	Edible	197
10	Asteraceae	<i>Centaurea bruguierana</i> Hand.-Mazz.	Badavoord	Young leaves (7) / Aerial parts (7)	Pertussis (1), hyperglycemia (1) cold (1), stomach ache (2), joint pain (back and leg) (1), and flatulence (1), with a warm nature?	Decoction (7)/ aromatic Water (7), Soaking in water(7)		188
11	Asteraceae	<i>Cichorium intybus</i> L.	Kashni	Leaf (15)	Hyperlipidemia (2), jaundice (2), hypertension (3), and skin disease (8), with a cool nature?	Aromatic water (15)/raw (13)	Edible	244
12	Asteraceae	<i>Echinops endotrichus</i> Rech.f	Shakrook	Cocoon on stem (20)	Cold (18), stomach ache (1), and toothache (1), with a cool nature?	Decoction (20)	Raw receptacle edible	183

13	Asteraceae	<i>Gundelia tournefortii</i> L.	Kangar	Root (4) and gum (2)	Pustules (2), nervous disorders (1), blood purification (1), and hyperglycemia (2), with a cool nature?	Poultice (2)/ Steamed (4)	Edible	145
14	Asteraceae	<i>Helianthus annuus</i> L.	Aftoparast	Seed (9)	Kidney stones (1), nervous disorders (2), hair tonic (1), throat infection (1), and hyperlipidemia (4), with a cool nature?	Raw (9)/ roasted (9)	Edible	219
15	Asteraceae	<i>Matricaria aurea</i> (Loefl.) Sch.Bip.	Bovinak	Whole plant (24)	Ear ache (1), cold (1), nervous disorders (16), bellyache (2), pustules (1), body aches (2), and Hypertension (1), with a warm nature?	Decoction (24)	Vegetable soup	65
16	Asteraceae	<i>Onopordum acanthium</i> L.	Golgohri	Stem & Flower (22), Flower styles (1)	Body aches (2), kidney infection (1), hyperlipidemia (3), hyperglycemia (2) allergy (1), skin disease (1), stomach pain (1), cold (3), hypertension (1), general infection (7), and pertussis (1), with a cool nature?	Aromatic water (22), Decoction (22), and Raw (1)	Raw receptacle edible	189
17	Asteraceae	<i>Tragopogon collinus</i> DC.	Shangol	Young leaves (1)	Female infection (1), with a cool nature?			238
18	Boraginaceae	<i>Caccinia kotschy</i> Boiss.	Gavzabankohi	leaves and flower (20)	Heart tonic (1), stomach ache (2), cold (3), joint pain (back and leg) (7), nervous disorders (6) and head infection (1), with a warm nature?			247
19	Brassicaceae	<i>Descurainia Sophia</i> (L.) Webb ex Prantl	Khakshir	Seed (14)	Crampin (1), diarrhea (4), measles (2), skin disease (1), jaundice (2), winner of bile (2), cold (1), and allergy (1), with a cool nature?		Syrup	201
20	Brassicaceae	<i>Raphanus raphanistrum</i> subsp. <i>sativus</i> (L.) Domin.	Torvezehsiah	Root (19)	Kidney stones (15), cold (1) and winner of bile (3), with a cool nature?		Edible	248
21	Capparaceae	<i>Capparis spinosa</i> L.	Hndonehgorgi	Fruit (17) and seed (2)	Hyperlipidemia (7), hyperglycemia (9), kidney stones (1), stomach ache (1), and gastrointestinal parasites (1), with a warm nature?		Pickle	206
22	Convolvulaceae	<i>Convolvulus arvensis</i> L.	Pichpichok	Leaf (1)	Indigestion (1), with a cool nature?		Vegetable soup	209
23	Convolvulaceae	<i>Convolvulus gonocladus</i> Boiss.	Mokhoreh	Fruit (5)	Hair brittle (5), with a warm nature?		Number of fruits close together and	204

							put in hair (5)	
2 4	<i>Convolvulaceae</i>	<i>Ipomoea purpurea</i> (L.) Roth	Nilofar-Lolofar	Flower (7)	Allergy (1), cold (3) and nervous disorders (3), with a warm nature?		Ornamental plant	174
2 5	<i>Cucurbitaceae</i>	<i>Cucurbita pepo</i> L.	Kodi	Seed (3) and fruit (7)	Gastrointestinal parasites (3), general infection (1), hypertension (1) and hyperlipidemia (5), with a cool nature?	Raw(3)/roasted(3)/steamed (7)	Edible	218
2 6	<i>Ephedraceae</i>	<i>Ephedra major</i> Host	Koshtar	Leaves and stem (19)	Female disease (2), kidney stone (3), general infection (8), asthma (1) and stomach aches (5), with a warm nature?	Decoction (19)/aromatic Water (19)		223
2 7	<i>Euphorbiaceae</i>	<i>Ricinus communis</i> L.	Knti	Seed (19)	Joint pain (back and leg) (1), laxative (1), improves burn (4) and wound infection (13), with a cool nature?	Ointment (19)	Evil eye	202
2 8	<i>Fabaceae</i>	<i>Alhagi pseudalhagi</i> (M. Bieb.) Desv.	Kharshotor	Aerial parts (17)	Headache (1), joint pain (back and leg) (1), hyperglycemia (1), kidney stones (11), female reproductive infection (2) and aperients (1), with a cool nature?	Aromatic water (17)		210
2 9	<i>Fabaceae</i>	<i>Astragalus crenatus</i> Schultes	Kllmlel	Seed (19)	Cold (12), stomachache (2), nervous disorders (1), general infection (3), and lung infection (1) with a cool nature?	Decoction (19)	Edible	143
3 0	<i>Fabaceae</i>	<i>Astragalus fasciculifolius</i> Boiss.	Gineh	Roots and gum (6)	Hyperglycemia (6), with a cool nature?	Decoction (6)		37
3 1	<i>Fabaceae</i>	<i>Glycyrrhiza glabra</i> L.	Mak	Rhizome (23), and leaves (4)	Stomach ache (3), cold (15), refrigerant (1), kidney disease (1), bone fractures (4), winner of bile (2) and general infection (1), with a warm nature?	Decoction (23)/poultice (4)		191
3 2	<i>Fabaceae.</i>	<i>Medicago rigidula</i> (L.) All.	Konjrh	Whole plant (11)	Cold (6), stomach ache (2), body aches (1), kidney stones (1) and general infection (1), with a cool nature?	Decoction (11)		133
3 3	<i>Fabaceae</i>	<i>Medicago sativa</i> L.	Yonjeh	Aerial parts (8)	Appetizer (3), pain leg (1), hyperlipidemia (1), osteoporosis (1) and nosebleed (2), with a warm nature?	Aromatic water (3)/decoction (5)	Livestock forage/ Vegetable soup	240
3 4	<i>Fumariaceae</i>	<i>Fumaria parviflora</i> Lam.	Shahtareh	Whole plant (10)	Jaundice (6), skin disease (1), allergy (1), cold (1) and hypertension (1), with a	Aromatic water (9), poultice		54

					cool nature?	(1), and decoction (1)		
35	Geraniaceae	<i>Erodium cicutarium</i> (L.) L'Her. ex Aiton	Sozansanjagh	Whole plant (1)	Cold (1), with a cool nature?	Decoction (1)		31
36	Juglandaceae	<i>Juglans regia</i> L.	Gerdo	Flowers (10), and fruit (1)	Hyperlipidemia (7), female disease (1), bruise (1) and memory improvement (1), with a warm nature?	Decoction (10)	Spice	243
37	Lamiaceae	<i>Mentha longifolia</i> (L.) Huds	Peden	Aerial parts (18)	Flatulence (1), stomach ache (12), asthma (1), body aches (1), osteoporosis (2) and general infection (1), with a warm nature?	Aromatic water (18), / powder (17), and raw (17)	Spice/vegetable soup	213
38	Lamiaceae	<i>Gundelia tenuisecta</i> Freyn and Sint.	Chaykohi	Aerial parts (20)	Flatulence (3), body aches (8), hyperglycemia (1), peripheral nerves (3), hyperlipidemia (2), hypotension (1), rheumatism (1), and kidney stones (1), with a warm nature?	Decoction (20)		171
39	Lamiaceae	<i>Rydingia persica</i> (Burm.f.) Scheen and V.A.Albert.	Chozari	Roots (9) and aerial parts (11)	Jaundice (4), hyperglycemia (3), body aches (1), hyperlipidemia (2), general infection (1), and nose bleeding (9), with a cool nature?	Decoction (11)/soaking in water (9)		194
40	Lamiaceae	<i>Salvia macrosiphon</i> Boiss.	Marvereshk	Seed (24)	Cold (15), general infection (6) and abortion (3), with a cool nature?	Decoction (24)	Off flies	178
41	Lamiaceae	<i>Satureja bachtiarica</i> Bunge	Oshombarko	Aerial parts (20)	Body ache (15), abdominal pain (3), general infection (1) and regulating menstruation (1), with a very warm nature?	Decoction (20)		6
42	Lamiaceae	<i>Teucrium orientale</i> L.	Goldedokhtar	Aerial parts (7)	Flatulence (2), skin disease (2), backache (1), general infection (1) and nosebleed (1), with a warm nature?	Decoction (6)/smoke (1)		199
43	Lamiaceae	<i>Teucrium polium</i> L.	Alpeh	Aerial parts (27)	Hyperlipidemia (5), hyperglycemia (2), general infection (11), stomach ache (2), nervous disorders (3), bruise (1), cold (2) and female disease (1), with a warm nature?	Decoction (26)/smoke (13)		195
44	Lamiaceae	<i>Zataria multiflora</i>	Oshompanoo	Aerial parts	Hyperlipidemia (4), flatulence (1), jaundice	Decoction (24)/		249

		Boiss.		(28)	(4), acidify (8), dysentery (3), nervous disorders (1), stomach infection (3), hypertension (2), hyperglycemia (1), and cold (1), with a cool nature?	aromatic water (4)		
4 5	Lamiaceae	<i>Ziziphora tenuior</i> L.	Pedenkohi	Whole plant (17)	Flatulence (2), joint pain (back and leg) (5), body aches (4), general infection (1), heart attack (1), and nervous disorders (4), with a warm nature?	Decoction (17)		102
4 6	Liliaceae	<i>Allium ampeloprasum</i> L.	Sir	Bulbs and Leaves (15)	Hyperlipidemia (3), body aches (5), stomach infection (2), diuretic (1), flatulence (1), stomach ache (1), stomach cancer (1) and hypertension (1), with a warm nature?	Raw (15)/steamed (15)	Edible/ Pickle	192
4 7	Liliaceae	<i>Allium ascalonicum</i> L.	Sirmook	Leaf (5)	Flatulence (3), and body aches (2), with a warm nature?	Steamed (5)/powder (5)	Vegetable soup	179
4 8	Liliaceae	<i>Allium cepa</i> L.	Piaz	Bulb (11)	Osteoporosis (1), stomach infection (8), cold (1), and toothache (1), with a cool nature?	Raw (10)/juice (1)	Edible	207
4 9	Lythraceae	<i>Punica granatum</i> L.	Nar	Fruit skin (21)	Ulcer (1), pertussis (7), cold (2), stomachache (9), acidify (1), and body aches (1), with a cool nature?	Powder (11)/decoction (10)	Edible	211
5 0	Malvaceae	<i>Alcea rosea</i> L.	Khatmi	Flower (18)	General infection (5), constipation (1), cold (10), allergy (1) and dry skin (1), with a cool nature?	Decoction (18)	Washing hair	203
5 1	Malvaceae	<i>Malva neglecta</i> Wallr.	Toleh	Leaves and stems (20)	Kidney stones (1), general infection (4), female disease (1), stomach infection (7), flatulence (1), constipation (1), and gastrointestinal parasites (5), with a cool nature?	Steamed (20)	Edible	63
5 2	Malvaceae	<i>Malva sylvestris</i> L.	Khatmigolri z	Flower (15)	Cold (9), allergy (1), constipation (1), dry skin (1) and general infection (3), with a cool nature?	Decoction (15)		196
5 3	Moraceae	<i>Ficus johannis</i> Boiss.	Katak	Fruit (1)	Osteoporosis (1), with a warm nature?	Raw (1)	Edible	186
5 4	Myrtaceae	<i>Myrtus communis</i> L.	Motr	Leaves (10) and	Headaches (1), skin disease (2), hypertension (1),	Raw (4)/powder (10)	Fruit is edible	250

				fruit (4)	general infection (1), hair tonic (8) stomach tonic (1), with a cool nature?			
55	Nitrariaceae	<i>Peganum harmala L.</i>	Donisht	Seed (15), Leaves (5), and Fruit (5)	Stomachache (7), female disease (2), acidify (6), and general infection (5), with a warm nature?	Raw (15)/ smoke (5)	Air disinfection/ evil eye	187
56	Papaveraceae	<i>Papaver macrostomum Boiss. & A.Huet</i>	Golchshardo	Flowers and Leaves (1)	Body aches (1), with a cool nature?	Poultice (1)/ powder (1)	Vegetable soup	142
57	Pedaliaceae	<i>Sesamum indicum L.</i>	Konjd	Seed (9)	Nervous disorders (3), backache (1), body aches (1), hypertension (1), skin disease (1), hyperlipidemia (1) and osteoporosis (1), with a warm nature?	Raw (9)/ roasted (9)	Edible	242
58	Phyllanthaceae	<i>Andrachne telephioide s L.</i>	Gazron	Whole plant (16)	Body aches (1), lung infection (2), general infection (1), and severe cold (12), with a cool nature?	Decoction (16)		190
59	Plantaginaceae	<i>Plantago lanceolata L.</i>	Barhang	(18) Seed	Nervous disorders (2), flatulence (1) jaundice (1), diarrhea (1) and cold (13), with a cool nature?	Decoction (18)		144
60	Poaceae	<i>Hordeum vulgare L.</i>	Jow	Seed (18)	Kidney stones (1), cold (3), lung infection (1), osteoporosis (1), general infection (1), improves burn (10) and skin disease (1), with a cool nature?	Decoction (7)/ poultice with grain burned powdered and used with Vaseline oil (11)	Soup	245
61	Poaceae	<i>Zea mays L.</i>	Zorat	Flower styles (26)	Kidney stones (14), female reproductive infection (6), backache (1) and cold (5), with very cool nature?	Decoction (26)	Seeds edible/ livestock forage	241
62	Portulacaceae	<i>Portulaca oleracea L.</i>	Gholfeh	Leaves and Stem (7)	Jaundice (1), blood purification (1), laxative (1), and gastrointestinal parasites (4), with a cool nature?	Raw (7)	Edible	215
63	Primulaceae	<i>Dionysia revoluta Boiss.</i>	Antari	Aerial parts (15)	Toothache (1), ear ache (1), body aches (7), cold (2), flatulence (1), general infection (1) and nervous disorders (2), with a warm nature?	Decoction (15)		120

64	Rhamnaceae	<i>Ziziphus jujuba Mill.</i>	Onnab	Fruit (21)	Jaundice (11), skin disease (1), cold (7), anxiety (1) and nausea (1), with a cool nature?	Decoction (7)/soaking in water (14)	Edible	212
65	Rosaceae	<i>Amygdalus eburnea Spach</i>	Chlal	Whole plant (8) and roots (2)	Hyperglycemia (3), nervous disorders (1), body aches (3), general infection (1), sore throat (1), and hyperlipidemia (1), with a warm nature?	Decoction (10)	Soup/ Fruit edible	172
66	Rosaceae	<i>Amygdalus scoparia Spach</i>	Alook	Fruit (16) and roots (1)	Skin disease (7), general infection (2), ulcer (3), sore throat (2), diarrhea (1), osteoporosis (1), and hyperglycemia (1), with a cool nature?	Decoction (17)	Edible/ Soup	173
67	Rosaceae	<i>Rosa × damascena Herrm.</i>	Golmohamadi	Flowers (15)	Constipation (10), allergy (1) and memory improvement (4), with a warm nature?	Aromatic water (5)/ decoction (15)	The jam is made from flowers	175
68	Rutaceae	<i>Citrus × aurantium L.</i>	Naranj	Bark (9) and Flowers (11)	Stomachache (8), general infection (1), allergy (1), acidify (1), nervous disorders (8) and body aches (1), with a warm nature?	The fruit bark grinded and used with cool water (9),/ decoction (11)	Flavors of tea	177
69	Solanaceae	<i>Solanum americanum Mill.</i>	Royaitorvak	Fruit (16)	Cold (6), constipation (5), general infection (2), stomach ache (2), and toothache (1), with a cool nature?	Raw (5)/ decoction (11)	Edible	220
70	Thymelaeaceae	<i>Daphne mucronata Royle</i>	Khishk	Gum (11)	Skin disease (4), jaundice (1), constipation (2), female disease (1), body aches (2), and general infection (1), with a cool nature?	Stem fire and used of the gum (11)?	Dyeing yarns	185
71	Urticaceae	<i>Parietaria judaica L.</i>	Marzangosh	Aerial parts (9)	Cold (9), with a cool nature?	Decoction (9)		181
72	Urticaceae	<i>Urtica pilulifera L.</i>	Alaf gzo	Leaf (6)	Cold (2), hyperglycemia (2) general infection (1), and hyperlipidemia (1), with a cool nature?	Decoction (6)	Edible/ vegetable soup	180

Table 2. Medicinal usage that mentioned in previous studies.

1	<i>Allium ampeloprasum L.</i>	Hyperlipidemia (N ⁴⁵), body aches (N ¹⁰⁰), stomach infection (N ⁴¹), Diuretic (N ¹⁰⁵), flatulence (-), stomach ache (N ⁵³), stomach cancer (N ⁶³) and hypertension (N ⁴⁵)
2	<i>Allium ascalonicum L.</i>	Flatulence (-), and body aches (-)
3	<i>Allium cepa L.</i>	Osteoporosis (N ³³), stomach infection (N ³⁴), cold (N ⁹⁹), and toothache (N ⁷² , N ⁷⁹)
4	<i>Anethum graveolens</i>	Hyperlipidemia (N ⁸ , N ²⁰ , N ⁴² , N ⁷² , N ⁷⁶ , N ⁷⁹ , N ⁸¹ , N ⁸² , N ⁸⁹) and memory

	L.	improvement (N ⁸⁶)
5	<i>Ducrosia anethifolia</i> Boiss.	Nosebleed (-), body aches (N ⁸¹), bloating (N ²⁰ , N ⁴² , N ⁹⁴ , N ¹⁰³ , N ¹⁰⁴ , N ¹¹⁵) and hyperlipidemia (-)
6	<i>Echinophora platyloba</i> DC.	Body aches (-), tooth ache (-), kidney stones (N ²⁰), female disease (N ²⁴), jaundice (-), cold (N ⁸⁹) general infection (N ¹ , N ² , N ⁴³ , N ⁹⁴), and bloating (-)
7	<i>Eryngium bungei</i> Boiss.	Cold (-), jaundice (-), nosebleed (-), kidney stones (-), general infection (N ¹²²) and skin disease (-)
8	<i>Ferula assa-foetida</i> L.	Cold (N ⁸⁴), diarrhea (N ⁷⁰), acidify (N ⁷⁰) gastrointestinal parasites (N ²⁰ , N ⁷² , N ⁸¹ , N ⁸² , N ¹⁰³), and joint pain (back and leg) (N ⁶)
9	<i>Foeniculum vulgare</i> Mill.	Nervous disorders (N ⁴¹), and acidify (N ¹⁸ , N ²⁰)
10	<i>Achillea santolinoides</i> Lag.	Stomach ache (N ⁶⁷ , N ⁷⁹), winner of bile (-), acidify (N), female reproductive infection (-), osteoporosis (-), bruise (-), and hyperlipidemia (-)
11	<i>Artemisia sieberi</i> Besser	Lumbago (-), winner of bile (-), acidify (N ¹⁰³), stomach ache (N ¹¹⁵), body aches (N ¹⁰³), and jundice (-)
12	<i>Carthamus oxyacantha</i> M. Bieb.	Laxative (N ⁴⁸), flatulence (-)
13	<i>Centaurea bruguierana</i> Hand.-Mazz.	Pertussis (-), hyperglycemia (N ²³ , N ⁴¹ , N ⁴²) cold (-), stomach ache (-), joint pain (back and leg) (N ⁴²), and flatulence (-)
14	<i>Cichorium intybus</i> L.	Hyperlipidemia (N ⁸ , N ³⁸ , N ⁴⁸ , N ⁸⁸ , N ⁹⁷ , N ¹⁰¹), jaundice (N ¹¹ , N ¹⁹ , N ⁴¹ , N ⁴⁸ , N ⁷⁶ , N ⁷⁹ , N ⁸⁸ , N ⁹³ , N ⁹⁴), hypertension (N ⁴⁸ , N ⁸⁹ , N ⁹⁷ ,), and skin disease (N ⁸ , N ²⁶ , N ⁴¹ , N ¹¹⁸),
15	<i>Echinops endotrichus</i> Rech.f..	Cold (N ¹²⁸), stomach ache (-), and toothache (-)
16	<i>Gundelia tournefortii</i> L.	Pustules (-), nervous disorders (-), blood purification (N ⁷⁶), and hyperglycemia (N ²⁷)
17	<i>Helianthus annus</i> L.	Kidney stones (N ⁴¹ , N ⁷²), nervous disorders (N ³⁶), strengthen the hair (N ²²), throat infection (N ²²), and hyperlipidemia (N ²² , N ¹¹⁹)
18	<i>Matricaria aurea</i> (Loefl.) Sch.Bip.	Ear ache (1), cold (N ⁷ , N ⁴¹), nervous disorders (N ⁴¹ , N ⁶⁷ , N ⁹⁴), bellyache (N ⁷), pustules (1), body aches (N ⁶²), and hypertension (N ⁴)
19	<i>Onopordum acanthium</i> L.	Body aches (-), kidney infection (N ⁷⁸), hyperlipidemia (-), hyperglycemia (-) allergy (-), skin disease (N ⁷⁸), stomach pain (N ¹²), cold (-), hypertension (-), general infection (N ⁷⁸), and pertussis (-)
20	<i>Tragopogon collinus</i> DC.	Female infection (-)
21	<i>Caccinia kotschy</i> Boiss.	Heart tonic (-), stomach ache (-), cold (-), joint pain (back and leg) (-), nervous disorders (-) and head infection (-)
22	<i>Descurainia Sophia</i> (L.) Webb ex Prantl	Crampin (N ¹⁰ , N ⁵⁵ , N ¹⁰²), diarrhea (N ⁷ , N ¹⁹ , N ⁴⁸ , N ⁶⁷ , N ⁷² , N ⁸¹ , N ⁸² , N ⁹⁷), measles (N ¹¹ , N ⁸⁸ , N ¹⁰³), skin disease (N ⁸⁸ , N ⁹⁴ , ¹⁰² , N ¹⁰³), jaundice (N ¹¹), winner of bile (-), cold (N ¹¹), and allergy (-)
23	<i>Raphanus raphanistrum</i> subsp. <i>sativus</i> (L.) Domin.	Kidney stones (N ³), cold (1) and winner of bile (-)
24	<i>Capparis spinosa</i> L.	Hyperlipidemia (N ⁵⁵), hyperglycemia (N ²³ , N ⁴² , N ⁵⁵ , N ¹²³), kidney stones (N ¹⁰), stomach ache (N ¹³⁰), and gastrointestinal parasites (N ¹⁹ , N ¹⁰²)
25	<i>Convolvulus arvensis</i> L.	Facilitate digestion (-)
26	<i>Convolvulus gonocladus</i> Boiss.	Hair brittle (-)
27	<i>Ipomoea purpurea</i> (L.) Roth	Allergy (-), cold (-) and nervous disorders (N ¹¹⁷),
28	<i>Cucurbita pepo</i> L.	Gastrointestinal parasites (N ¹² , N ⁷⁹ , N ⁸²), general infection (N ⁵), hypertension (N ⁵ , N ²⁹) and hyperlipidemia (N ⁵)
29	<i>Ephedra major</i> Host	Female disease (N ¹⁰⁶), kidney stone (-), general infection (N ¹²¹), asthma (N ¹²¹) and stomach aches (N ⁶⁷)
30	<i>Ricinus communis</i> L.	Joint pain (back and leg) (N ¹⁶ , N ⁹⁵), laxative (N ³ , N ⁶ , N ¹⁶ , N ⁴¹ , N ⁷⁶ , N ⁸⁷ , N ⁹⁴ , N ⁹⁷ , N ¹⁰⁴), improves burn (N ⁴² N ⁵⁶ , N ⁶⁴) and wound infection (N ⁴²)

31	<i>Alhagi pseudalhagi</i> (M. Bieb.) Desv.	Headaches (-), joint pain (back and leg) (-), hyperglycemia (-), kidney stones (N ⁶⁷ , N ⁷² , N ⁸¹), female reproductive infection (-) and aperients (N ⁷²)
32	<i>Astragalus crenatus</i> Schultes	Cold (N ⁸¹), stomachache (-), nervous disorders (-), general infection (-), and lung infection (-)
33	<i>Astragalus fasciculifolius</i> Boiss.	Hyperglycemia (N ²³)
34	<i>Glycyrrhiza glabra</i> L.	Stomach ache (N ⁷ , N ⁴¹ , N ⁴⁹ , N ⁵⁵ , N ⁶⁷ , N ⁶⁹ , N ⁷² , N ⁷⁹ , N ⁸¹ , N ⁸² , N ⁸⁹ , N ¹⁰²), cold (N ⁴⁸ , N ⁶⁷), refrigerant (N ¹²⁴), kidney disease (N ³⁷), bone fractures (N ⁷ , N ⁶⁷ , N ⁸⁹), winner of bile (N ⁷ , N ⁸¹ , N ⁸²) and general infection (N ¹¹¹)
35	<i>Medicago rigidula</i> (L.) All.	Cold (N), stomach ache (-), body aches (N), kidney stones (-) and general infection (-)
36	<i>Medicago sativa</i> L.	Appetizer (N ⁹⁴), pain leg (-), hyperlipidemia (N ⁴⁵ , N ⁹³), osteoporosis (N ⁷⁴ , N ¹¹⁸) and nosebleed (N ¹⁰¹)
37	<i>Fumaria parviflora</i> Lam.	Jaundice (N ⁸⁸), skin disease (N ¹ , N ⁶ , N ⁷⁶ , N ⁸¹ , N ⁸² , N ⁸⁸), allergy (-), cold (-) and hypertension (N ⁸⁸)
38	<i>Erodium cicutarium</i> (L.) L'Her. ex Aiton	Cold (N ¹)
39	<i>Juglans regia</i> L.	Hyperlipidemia (N ¹¹ , N ⁹²), female disease (N ¹¹⁸), bruise (N ¹⁰) and memory improvement (N ⁴⁰)
40	<i>Mentha longifolia</i> (L.) Huds	Flatulence (N ⁷ , N ⁹ , N ³⁹ , N ⁴¹ , N ⁴² , N ⁵⁴ , N ⁵⁹ , N ⁷² , N ⁷⁶ , N ⁸¹ , N ⁸² , N ⁸⁹ , N ⁹² , N ⁹⁸ , N ¹¹⁵ , N ¹¹⁸), stomach ache (N ⁹ , N ⁴⁸ , N ⁴⁹ , N ⁵⁹ , N ⁸¹ , N ⁸² , N ⁸⁹ , N ¹¹⁵), asthma (N ⁸⁹ , N ¹²³), body aches (N ⁹³), osteoporosis (-) and general infection (N ⁹ , N ⁷⁶)
41	<i>Micromeria persica</i> Boiss.	Flatulence (N ¹¹⁵), body aches (-), hyperglycemia (-), peripheral nerves (-), hyperlipidemia (-), hypotension (-), rheumatism (N ¹¹⁵), and kidney stones (-)
42	<i>Rydingia persica</i> (Burm.f.) Scheenand V.A.Albert.	Jaundice (-), hyperglycemia (N ²³ , N ⁵¹ , N ¹⁰³), body aches (N ¹⁰³), hyperlipidemia (N ¹⁰³ , N ¹⁰⁴), general infection (N ⁷⁶ , N ⁹⁴ , N ¹²³), and nose bleeding (-)
43	<i>Salvia macrosiphon</i> Boiss.	Cold (N ⁹⁴ , N ¹⁰⁷), general infection (N ¹⁰⁷) and abortion (-)
44	<i>Satureja bachtiarica</i> Bunge	Body ache (N ⁶²), abdominal pain (N ¹²⁷), general infection (N ⁵²) and regulating menstruation (-)
45	<i>Teucrium orientale</i> L.	Flatulence (-), skin disease (N ⁴²), lumbago (-), general infection (N ¹) and nose bleeding (-)
46	<i>Teucrium polium</i> L.	Hyperlipidemia (N ³⁹ , N ⁴⁸ , N ⁹² , N ¹⁰³ , N ¹⁰⁴), hyperglycemia (N ²³ , N ³⁹ , N ⁴¹ , N ⁴² , N ⁴⁸ , N ⁷² , N ⁹⁴ , N ¹⁰¹ , N ¹⁰³ , N ¹²³), general infection (N ²⁸ , N ⁴¹ , N ⁴⁸ , N ⁹⁴), stomach ache (N ⁵⁵ , N ⁷⁶ , N ⁸¹ , N ⁹² , N ⁹³ , N ⁹⁴ , N ⁹⁷ , N ¹⁰³ , N ¹¹⁵), nervous disorders (N ⁹² , N ⁹⁷), bruise (-), cold (N ⁵⁴ , N ⁹² , N ¹⁰¹) and female disease (N ⁸⁸ , N ¹⁰²)
47	<i>Zataria multiflora</i> Boiss.	Hyperlipidemia (N ¹²⁶), flatulence (N ⁵¹ , N ⁷⁶ , N ⁹⁷ , N ¹²⁶), jaundice (N ⁷⁵), acidify (N ⁵¹), dysentery (N ¹¹²), nervous disorders (N ¹⁰⁶), stomach infection (N ⁸¹ , N ⁸²), hypertension (-), hyperglycemia (N ²⁷), and cold (N ⁵¹ , N ⁷² , N ⁷⁶ , N ⁸¹ , N ⁸² , N ⁸⁸ , N ¹¹⁵ , N ¹²⁶)
48	<i>Ziziphora tenuior</i> L.	Flatulence (N ⁸² , N ⁹⁷), joint pain (back and leg) (N ⁸²), body aches (N ¹ , N ⁵⁷), general infection (N ⁵⁷ , N ⁷² , N ⁷⁶ , N ⁹⁴ , N ⁹⁷ , N ⁹⁸), heart attack (-), and nervous disorders (N ¹²³)
49	<i>Punica granatum</i> L.	Ulcer (N ⁷²), pertussis (N ⁵⁹), cold (N ¹²⁵), stomachache (N ⁶ , N ⁵⁵ , N ⁷⁹), acidify (N ⁵⁵), and body aches (N ¹¹⁴)
50	<i>Alcea rosea</i> L.	General infection (N ¹⁴), constipation (N ⁴⁴), cold (N ²⁵), allergy (-) and dry skin (N ⁹⁴)
51	<i>Malva neglecta</i> Wallr.	Kidney stones (N ⁶⁵), general infection (N ¹⁰ , N ¹¹ , N ²⁸), female disease (N ¹⁰ , N ¹¹), stomach infection (N ¹⁷), flatulence (N ¹⁰), constipation (N ¹⁰ , N ¹¹⁸), and gastrointestinal parasites (N ¹¹)
52	<i>Malva sylvestris</i> L.	Cold (N ⁶⁷ , N ⁷² , N ⁹⁷), allergy (1), constipation (N ⁴¹ , N ⁴² , N ⁸⁹ , N ⁹⁶), dry skin (N ⁹⁶ , N ¹⁰³) and general infection (N ⁴⁸ , N ⁷² , N ⁹⁶)
53	<i>Ficus johannis</i> Boiss.	Osteoporosis (-)
54	<i>Myrtus communis</i> L.	Headaches (N ⁸¹), skin disease (N ⁶⁶ , N ⁸³), hypertension (N ¹¹⁰), general infection (N ⁶⁶ , N ⁷⁶ , N ⁸² , N ⁸³ , N ⁸⁵ , N ⁹⁴ , N ¹⁰²), hair tonic (N ¹ , N ⁴¹ , N ⁷² , N ⁹⁴) and stomach tonic (N ⁸⁸)
55	<i>Peganum harmala</i> L.	Stomachache (N ⁶¹), female disease (N ⁸⁸), acidify (N ⁶¹), and general infection (N ⁶ , N ⁴¹ , N ⁴⁸ , N ⁸² , N ⁹³ , N ⁹⁴ , N ⁹⁷ , N ⁹⁸ , N ¹⁰³ , N ¹⁰⁴)

56	<i>Papaver macrostomum</i> Boiss. & A.Huet	Body aches (N ⁷⁹)
57	<i>Sesamum indicum</i> L.	Nervous disorders (N ¹³ N ²¹ , N ³²), lumbago (N ¹⁰⁹), body aches (N ⁹⁰), hypertension (N ³⁵), skin disease (N ⁷³), hyperlipidemia (N ¹⁰²) and osteoporosis (N ²¹)
58	<i>Andrachne telephioides</i> L.	body aches (-), lung infection (-), general infection (-), and severe cold (-)
59	<i>Plantago lanceolata</i> L.	Nervous disorders (N ⁷⁴), flatulence (N ⁶⁸ , N ¹²⁴) jaundice (N ⁹³), diarrhea (N ⁷⁹) and cold (N ⁶¹ , N ⁶⁷ , N ⁷² , N ⁷⁶ , N ⁷⁹)
60	<i>Hordeum vulgare</i> L.	Kidney stones (N ⁶⁰), cold (N ⁴⁹), lung infection (N ⁹¹), osteoporosis (-), general infection (N ¹¹³), improves burn (N ⁴¹) and skin disease (N ⁸⁰)
61	<i>Zea mays</i> L.	Kidney stones (N ³⁷ , N ⁴⁹ , N ⁵⁵ , N ⁷⁹ , N ⁹² , N ¹⁰³), female reproductive infection (-), lumbago (-) and cold (N ⁷⁹)
62	<i>Portulaca oleracea</i> L.	Jaundice (N ¹⁹), blood purification (N ³⁹ , N ⁴¹ , N ⁴² , N ⁸² , N ⁹⁴), laxative (N ¹²⁹), and gastrointestinal parasites (N ⁹⁴)
63	<i>Dionysia revoluta</i> Boiss.	Toothache (-), ear ache (-), body aches (N ⁴⁶), cold (N ¹⁰⁶), flatulence (N ¹¹⁵), general infection (N ¹⁰⁶) and nervous disorders (-)
64	<i>Ziziphus jujuba</i> Mill.	Jaundice (N ¹⁹ , N ⁴² , N ⁷⁹), skin disease (N ⁴¹ , N ⁷⁹), cold (N ⁸⁸), anxiety (N ⁴⁷) and nausea (-)
65	<i>Amygdalus eburnea</i> Spach	Hyperglycemia (-), nervous disorders (-), body aches (N ⁹⁴ , N ¹⁰²), general infection (N ⁹⁴), sore throat (-), and hyperlipidemia (-),
66	<i>Amygdalus scoparia</i> Spach	Skin disease (N ⁴¹ , N ⁷⁶ , N ⁹⁸ , N ¹²³), general infection (-), ulcer (N ⁸¹), sore throat (N ⁵⁰), diarrhea (N ⁸¹), osteoporosis (N ⁷⁷), hyperglycemia (N ²³ , N ²⁷ , N ⁷²)
67	<i>Rosa × damascena</i> Herrm.	Constipation (N ³ , N ⁷⁹ , N ⁸⁹), allergy (N ³⁰ , N ¹²⁵) and memory improvement (N ⁹ , N ⁹⁴)
68	<i>Citrus × aurantium</i> L.	Stomachache (N ¹⁵), general infection (N ¹¹⁶), allergy (-), acidify (-), nervous disorders (N ⁹⁴), body aches (N ⁸⁵),
69	<i>Solanum americanum</i> Mill.	Cold (N ¹²⁰), laxative (N ¹⁰⁸), general infection (N ³¹), stomach ache (N ¹²⁰), and toothache (N ⁵⁸),
70	<i>Daphne mucronata</i> Royle	Skin disease (N ⁷), jaundice (-), constipation (N ⁸⁸ , N ¹²³), female disease (N ⁸⁸), body aches (N ⁷¹), and general infection (N ⁸⁸),
71	<i>Parietaria judaica</i> L.	Cold (-)
72	<i>Urtica pilulifera</i> L.	Cold (-), hyperglycemia (N ⁴¹ , N ⁸²) general infection (N ⁴¹), and hyperlipidemia (-)

Informants Consensus Factor (F_{ic}): The Informant Consensus Factor (F_{ic}) evaluates the homogeneity of information obtained from informants and is calculated by the following formula.

$$F_{ic} = \frac{N_{ur} - N_t}{(N_{ur} - 1)}$$

Where N_{ur} is the number of informants citations used for a particular illness category and N_t is the number of Species used for this particular illness category. F_{ic} ranges between 0 and 1. High F_{ic} (close to 1) indicates complete agreement among informants for the use of species for the treatment within a category of ailment while a low F_{ic} (close to 0) indicates no agreement among informants on the use of species for the treatment within a category of ailment.

Cultural importance index (CI): In this study we used the Cultural Importance Index (CI) (Tardio and Pardo-de Santayana, 2008). This index is defined with using the following equation:

$$CI = \frac{\sum_{u=1}^{u=NC} \sum_{i=1}^{i=N} UR_{ui}}{N}$$

Cultural Importance Index (CI) that is calculated by the sum of the proportion of informants that citation each plant species use. We take this index to account the spread of the use (number of informants) for each species, moreover diversity of uses.

Relative Frequency of Citation (RFC): Relative Frequency of Citation (RFC), this index does not consider the use-category (Variable u) and is obtained by the number of informants who mention a plant as being useful divided by total number of informants participated in the survey (N) and is calculated according to the following formula:

$$RFC_s = \frac{FCS}{N} = \frac{\sum_{i=1}^{i=N} UR_i}{N}$$

The RFC range varies, from 0, when nobody mentions a plant as being useful, to 1 when all the informants mention a plant as being useful.

RESULTS AND DISCUSSION

Plants and their applications

During this ethnobotanical survey, 72 plant species consisting of 64 genera and 33 families were reported by informants. Information about plants local names and their consumable parts are shown in Table 1. Asteraceae with 11 species is the largest family (Figure 2). Similar results have been reported in other parts of Iran and in Fars province [36-41]. The family of Lamiaceae with nine species is in the second position. Lamiaceae is an important family to have medicinal species that show in other ethnobotanical study in different regions of Iran [42]. More than 98% of medicinal plants collected are flowering plants. Of these, 77% are wild and 23% are implants (Figure 3). Based on the results, most (20%) consumable parts are leaves (Figure 4). In other ethnobotanical studies conducted elsewhere have shown that the major plants parts used has herbal medicine are the leaves [43-49]. Leaves contain high concentrations of bio-active compounds [50]. Most of the medicinal plants (65%) are used to treat gastrointestinal diseases (Figure 5). Eighty-seven percent (63 species) of plants have more than one pharmaceutical property and only thirteen percent (9 species) of plants are used for single illness (Table 1).

Analysis of the data based on plants habits show that more than 80 % of medicinal plants are herbaceous species (Figure 6). Of total 72 species, 40 species are only used as medicine for the treatment of diseases and 34 species are medicinal as well as edible. Medicinal plants are often consumed as decoction (40%). A study in different regions of Iran shows that decoction is a common method in the preparation of medicinal plants [51-56]. Other methods include aromatic water, powder, Poultice, nose drops, soaking in water and steam inhalation (Table1). Medicinal plants are often used in dried state (69%) Of total species 83% are consumed orally. Similar results have been reported for ethnobotanical studies in the south of Kerman [57-60]. Some species such as *Achillea santolinoides*, *Fumaria parviflora*, *Citrus aurantium* and *Glycyrrhiza glabra* are used orally and topically.

Figure 2. Plant families with the highest number of species.

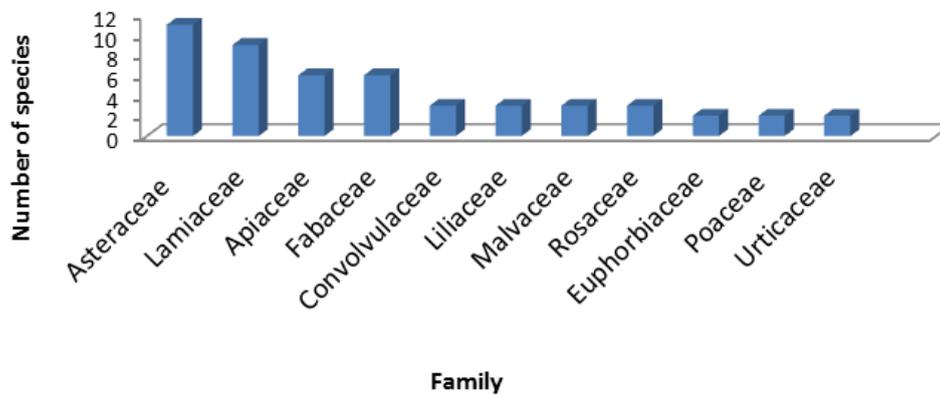


Figure 3. Management status.

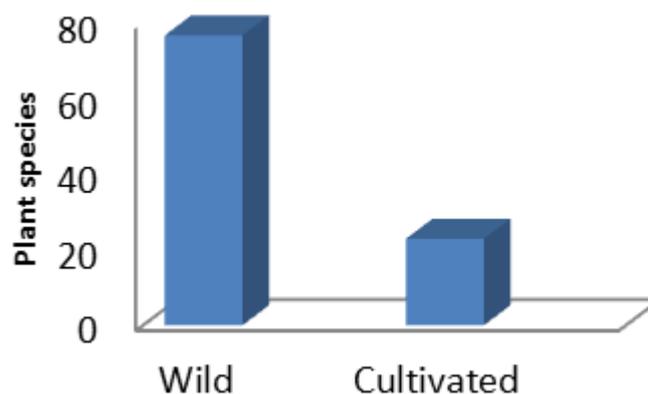


Figure 4. Percentage of plant parts used.

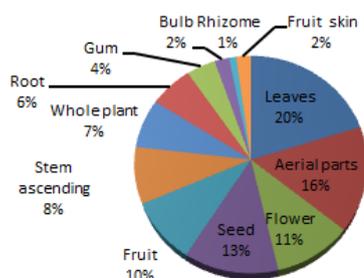


Figure 5. Percentage of plant species used for each illness- category.

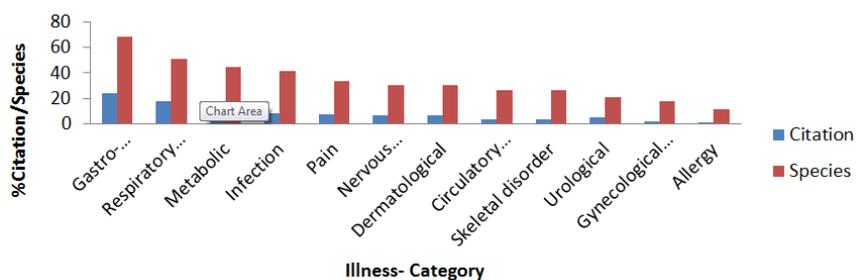
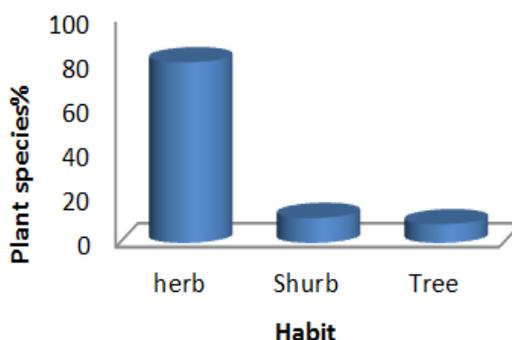


Figure 6. Percent of growth habit.



Use reports and use categorize

In our study, 1053 use reports have been documented that are being used to treat 70 different ailments and categorized in twelve different illness sets. These include digestive system disorder (24%) with the highest number of records, respiratory disorders (18.1%) and metabolic disorders (13.2%) are placed in the next categories respectively (Figure 5). In similar studies conducted in other parts of Iran and world, the use of medicinal plants for treatment of gastrointestinal disorders has had a high prevalence [61-65]. Based on the results, stomach pain, bellyache and flatulence were the most prevalence diseases of the gastrointestinal tract. The prevalent gastrointestinal disorder among local people of Akbarabad village is largely due to lack of access to safe drinking water. Similar results have been obtained from ethnobotanical studies in the town of Sirjan [66,67]. Respiratory disorders were ranked in next position. Because of the prevalence of respiratory diseases in Akbarabad, especially in cold seasons, a significant number of medicinal plants are used to treat respiratory problems [68-72].

Comparing different indices

In this study by comparing the indices, one can determine those species which have more cultural significance, broader use and more popular among local people. The plant species ranking based on each index is shown in Table 3 [73,74].

Table 3. Comparison of medicinal plants species by using indices and species ranking based on each index.

Family	Scientific name	FC	UR	NU	RFC	CI	RFC ranking	CI ranking
Lamiaceae	<i>Zataria multiflora</i> Boiss.	17	28	5	0.894	1.4734	3	1
Fabaceae	<i>Glycyrrhiza glabra</i> L.	19	27	5	1	1.4209	1	2
Lamiaceae	<i>Teucrium polium</i> L.	17	27	7	0.894	1.4207	3	3
Poaceae	<i>Zea mays</i> L.	17	26	4	0.894	1.3682	3	4
Asteraceae	<i>Artemisia sieberi</i> Besser	19	24	4	1	1.263	1	5
Asteraceae	<i>Matricaria aurea</i> Sch.Bip.	17	24	6	0.894	1.263	3	5
Lamiaceae	<i>Salvia macrosiphon</i> Boiss.	17	24	3	0.894	1.263	3	5
Asteraceae	<i>Achillea santolinoides</i> Lag.	19	24	5	1	1.2629	1	6
Asteraceae	<i>Onopordum leptolepis</i> Dc.	15	23	9	0.789	1.2102	5	7
Apiaceae	<i>Ferula assa-foetida</i> L.	19	21	3	1	1.1051	1	8
Punicaceae	<i>Punica granatum</i> L.	17	21	3	0.894	1.1051	3	8
Rhamnaceae	<i>Ziziphus jujuba</i> Mill.	15	21	5	0.789	1.1051	5	8
Lamiaceae	<i>Satureja bachtiarica</i> Bunge	18	20	4	0.947	1.0524	2	9
Zygophyllaceae	<i>Peganum harmala</i> L.	18	20	3	0.947	1.0525	2	10
Asteraceae	<i>Echinops endotrichus</i> Rech. f.	18	20	3	0.947	1.0525	2	10
Malvaceae	<i>Malva neglecta</i> Wallr.	16	20	4	0.842	1.0525	4	10
Malvaceae	<i>Malva neglecta</i> Wallr.	16	20	4	0.842	1.0525	4	10
Apiaceae	<i>Ducrosia anethifolia</i> Boiss.	13	20	4	0.684	1.0525	7	10
Rutaceae	<i>Citrus × aurantium</i> L.	15	20	5	0.789	1.0524	5	11
Lamiaceae	<i>Rydingia persica</i> (Burm.f.) Scheen & V.A.Albert.	16	20	4	0.842	1.0524	4	11
Lamiaceae	<i>Micromeria persica</i> Boiss.	14	20	7	0.736	1.0522	6	12
Capparaceae	<i>Capparis spinosa</i> L.	18	19	3	0.947	0.9999	2	13
Euphorbiaceae	<i>Ricinus communis</i> L.	17	19	4	0.894	0.9999	3	13
Brassicaceae	<i>Raphanus raphanistrum</i> subsp. <i>sativus</i> (L.) Domin.	17	19	3	0.894	0.9998	3	14
Fabaceae	<i>Astragalus crenatus</i> Schultes	15	19	4	0.789	0.9998	5	14
Ephedraceae	<i>Ephedra major</i> Host	13	19	5	0.684	0.9997	7	15
Lamiaceae	<i>Mentha longifolia</i> (L.) Huds	14	18	5	0.736	0.9472	6	16
Poaceae	<i>Hordeum vulgare</i> L.	15	18	5	0.789	0.9472	5	16
Malvaceae	<i>Alcea rosea</i> L.	14	18	5	0.736	0.9472	6	16
Plantaginaceae	<i>Plantago lanceolata</i> L.	14	18	4	0.736	0.9472	6	16
Fabaceae	<i>Alhagi pseudalhagi</i> (M. Bieb.) Desv.	12	17	6	0.631	0.8945	8	17
Lamiaceae	<i>Ziziphora tenuior</i> L.	14	17	6	0.736	0.8945	6	17
Rosaceae	<i>Amygdalus scoparia</i> Spach	12	17	6	0.631	0.8945	8	17
Apiaceae	<i>Echinophora platyloba</i> DC.	13	17	7	0.684	0.8944	7	18
Euphorbiaceae	<i>Andrachne telephioides</i> L.	14	16	3	0.736	0.842	6	19
Solanaceae	<i>Solanum americanum</i> Mill.	12	16	4	0.631	0.842	8	19

Apiaceae	<i>Eryngium bungei</i> Boiss.	12	16	6	0.631	0.841	8	20
Rosaceae	<i>Rosa × damascena</i> Herrm.	12	15	3	0.631	0.7894	8	21
Asteraceae	<i>Cichorium intybus</i> L.	11	15	3	0.578	0.7893	9	22
Primulaceae	<i>Dionysia revoluta</i> Boiss.	13	15	5	0.684	0.7892	7	23
Malvaceae	<i>Malva sylvestris</i> L.	12	15	5	0.631	0.7892	8	23
Liliaceae	<i>Allium ampeloprasum</i> L.	9	15	5	0.473	0.7891	11	24
Apiaceae	<i>Foeniculum vulgare</i> Mill.	12	14	2	0.631	0.7368	8	25
Myrtaceae	<i>Myrtus communis</i> L.	10	14	5	0.526	0.7367	10	26
Brassicaceae	<i>Descurainia sophia</i> (L.) Webb ex Prantl	10	14	5	0.526	0.7366	10	27
Apiaceae	<i>Anethum graveolens</i> L.	12	12	2	0.631	0.6309	8	28
Liliaceae	<i>Allium cepa</i> L.	11	11	4	0.578	0.5788	9	29
Thymelaeaceae	<i>Daphne mucronata</i> Royle	9	11	6	0.473	0.5787	11	30
Fabaceae	<i>Medicago rigidula</i> (L.) All.	8	11	5	0.421	0.5787	12	30
Juglandaceae	<i>Juglans regia</i> L.	9	10	4	0.473	0.5262	11	31
Rosaceae	<i>Amygdalus eburnea</i> Spach	8	10	5	0.421	0.5261	12	32
Cucurbitaceae	<i>Cucurbita pepo</i> L.	8	10	4	0.421	0.5261	12	32
Fumariaceae	<i>Fumaria parviflora</i> Lam.	6	10	5	0.315	0.5261	14	32
Urticaceae	<i>Parietaria judaica</i> L.	9	9	1	0.473	0.4736	11	33
Asteraceae	<i>Helianthus annuus</i> L.	7	9	5	0.368	0.4735	13	34
Pedaliaceae	<i>Sesamum indicum</i> L.	6	9	6	0.315	0.4734	14	35
Fabaceae	<i>Medicago sativa</i> L.	7	8	4	0.368	0.4208	13	36
Portulacaceae	<i>Portulaca oleracea</i> L.	5	7	3	0.263	0.3683	15	37
Lamiaceae	<i>Teucrium orientale</i> L.	6	7	5	0.315	0.3682	14	38
Convolvulaceae	<i>Ipomoea purpurea</i> (L.) Roth	6	7	3	0.315	0.3682	14	38
Asteraceae	<i>Centaurea bruguierana</i> Hand.-Mazz.	4	7	4	0.21	0.3682	16	38
Fabaceae	<i>Astragalus fasciculifolius</i> Boiss	6	6	1	0.315	0.3157	14	39
Asteraceae	<i>Gundelia tournefortii</i> L.	5	6	4	0.263	0.3156	15	40
Urticaceae	<i>Urtica pilulifera</i> L.	5	6	3	0.263	0.3156	15	40
Convolvulaceae	<i>Convolvulus gonocladus</i> Boiss.	5	5	1	0.263	0.2631	15	41
Liliaceae	<i>Allium ascalonicum</i> L.	5	5	2	0.263	0.263	15	42
Asteraceae	<i>Carthamus oxyacantha</i> M. Bieb.	2	2	1	0.105	0.1052	17	43
Papaveraceae	<i>Papaver halophilum</i> (Fedde) Cullen	1	1	1	0.052	0.0526	18	44
Convolvulaceae	<i>Convolvulus arvensis</i> L.	1	1	1	0.052	0.0526	18	44
Geraniaceae	<i>Erodium cicutarium</i> (L.) L'Her. ex Aiton	1	1	1	0.052	0.0526	18	44
Moraceae	<i>Ficus johannis</i> Boiss.	1	1	1	0.052	0.0526	18	44
Asteraceae	<i>Tragopogon collinus</i> DC.	1	1	1	0.052	0.0526	18	44

According to different indices, different species are in the first position, although according to RFC index four species *Glycyrrhiza glabra*, *Artemisia sieberi*, *Achillea santolinoides* and *Ferula assa-foetida* are placed in the first position (these species are valuable medicinal plants agreed by the total number of informants), while were ranked 2nd, 5th, 6th, 8th, by CI index, which indicates that few number of medicinal properties of this species were mentioned by total number of informants who participated in this study. In similar study in Sirjan, according to RFC index *Glycyrrhiza glabra* is placed in the first position while was ranked 2nd by CI index [75-80]. *Glycyrrhiza glabra* used to treat Stomach ache, refrigerant, kidney disease, bone fractures, general infection and the most commonly used to treat the common cold in Akbrabad village. Some medicinal effect of this plant mentioned in laboratory research [81-90]. *Ferula assa-foetida* is an important medicinal

plant in culture of Akbrabad village. The prevalence use of this plant is in gastrointestinal problem such as diarrhea, gastrointestinal parasites and bellyache. In other parts of Iran, this plant is used as a medicinal plant [91-100]. Due to the medicinal value, some of laboratory research has been done on the healing properties of this plant, *Onopordum acanthium* has the most medicinal usage among local people of Akbarabad village that less mentioned in previous studies, further research of this plant is needed to fully reveal its therapeutic properties [101,102].

According to CI, *Zataria multiflora* (28 UR) is placed in the first position, because RFC index assessment based on Frequency of Citation (FC), while CI index assessment based on use report. Similar results have been reported in Jam and Riz in Bushehr province [103-106]. *Zataria multiflora* is valuable medicinal plant that used to treat diseases such as hyperlipidemia, jaundice, dysentery, nervous disorders, stomach infection, blood pressure and cold in Akbarabad village. Laboratory tests indicate strong antibacterial and excellent protective features in antioxidant activity of this plant [107-110]. *Zataria multiflora* was ranked 3rd by RFC index. Because of, although the most use report of this plant mentioned by informants, all informants have not indicated this species as being a medicinal plant. *Glycyrrhiza glabra*, *Teucrium polium* and *Zea mays* were ranked 2nd, 2nd, and 3rd, by CI index respectively (Table 2) [111-119]. According to RFC and CI index, *Convolvulus arvensis*, *Erodium cicutarium*, *Ficus johannis*, *Papaver macrostomum* and *Tragopogon collinus* have the lowest positions, so that, not only a few number of informants have mentioned their medicinal properties but also they have a few medicinal usage by local people. In previous Ethnobotanical study, these five species do not mentioned or less mentioned (Table 4) [120-128].

The Informant Consensus Factor (F_{ic}) for twelve of the use categories is shown in Table 3 [129,130]. The highest level of consensus is obtained for respiratory disorders (F_{ic}=0.810) and the lowest for allergy (F_{ic}=0). This indicates that there is no general agreement among informants on the use of species for treatment within a category of ailment. In the past, due to the use of natural ingredients, allergy have not been common among Akbarabad people, this is one of the reasons for the low general agreement on the use of medicinal plants in the treatment of allergy. Today, due to the changing lifestyle and the presence of chemical compounds in consuming materials and especially detergents, allergy is very common among local people of Akbarabad. Based on the results, eight species *Onopordum acanthium*, *Descurainia Sophia*, *Ipomoea purpurea*, *Fumaria parviflora*, *Alcea rosea*, *Malva sylvestris*, *Rosa damascene*, *Citrus aurantium* are used in the treatment of allergy. This therapeutic effect of these plants less mentioned in previous studies, and therefore laboratory studies are required to determine this medicinal effect of these plants. In this study the mean of Informant Consensus Factor (F_{ic}) is 0.61. Access to health care facilities can be one factor in low number of consensus people for medicinal plants in Akbarabad village [131-136].

Table 4. Informant Consensus Factor for different use categories.

Use-category	Nt	Nur	Fic
Respiratory disorders	37	191	0.8105
Gastro-intestinal disorders	49	253	0.8095
Metabolic	32	139	7753
Urological	15	56	7454
Pain	24	77	0.6973
Nervous disorders	22	70	0.6956
Dermatological	22	69	6911
Infection	30	89	0.6704
Circulatory system disorder	19	39	0.5263
Skeletal disorders	19	38	0.5135
Gynecological disorders	13	24	0.4782
Allergy	8	8	0
Nt: Number of Taxa (species); category FIC: Informant Consensus Factor. Nur: Number of mention in each use category.			

Combined uses of plants

The inhabitants of Akbarabad village usually use only one plant for the treatment of a particular disease; however one of the informants believed that for better treatment of diseases, some medicinal plants should be used in combination with others. For example, the combination of three plants, *Plantago lanceolata*, *Salvia macrosiphon*, and *Zea mays* is useful in the treatment of female reproductive infection. The combination of *Zataria multiflora*, *Punica granatum*, and *Citrus aurantium* is effective in the treatment of stomachache, also the combination of *Echinops endotrichus* and *Glycyrrhiza glabra* is useful in the treatment of cold [137-140].

Other applications of medicinal plants

The medicinal plants are often used as food (54%). It is believed that the smoke of *Peganum harmala* can be used as house disinfectant [141]. People hang the branches of *Salvia macrosiphon* in the houses to ward off flies. *Myrtus communis* is used in weddings. The aromatic water obtained from *Rosa damascene* is used in religious ceremonies [142-146]. *Convolvulus arvensis* is used for cooking dough pottage. *Mentha longifolia* (Peden) is used both as fresh vegetable and spice. *Ficus johannis* and *Capparis spinosa* are used in pickles. *Tragopogon collinus* is an edible plant and is used as fresh vegetable [147]. Fruits of *Amygdalus scoparia* are used in making soup (Table 1).

Economic plants

In the past, *Amygdalus scoparia* was used as fuel, in construction and basket weaving. *Daphne mucronata* was used for making natural dye. *Medicago sativa*, *Hordeum vulgare* and *Zea mays* are used as forage. *Cucurbita pepo* is exported to other countries to be used as food (Table 1) [148]. Ten species of cultivated medicinal plants are valuable economical commodities. There is no active market for the sale of medicinal plants in Akbarabad, but sometimes species such as *Ferula assa-foetida*, *Cichorium intybus*, and *Zataria multiflora* are sold locally [149-154].

Side effects of medicinal plants

According to local guides, large part of medicinal plants has little or no side effects, nevertheless, some medicinal plants have shown to have side effects. For example, consuming the seeds of *Ricinus communis* has negative effects on the nervous system. Seed of *Peganum harmala* should not be consumed in large amounts.

Comparison among reported species in study and previous studies

Comparison among medicinal effects with previous studies (Table 5) shows that *Descurainia Sophia*, *Foeniculum vulgare*, and *Ferula assa-foetida*, are used in Gastro-intestinal disorders in Akbarabad as well as in Kerman Province [155]. *Artemisia siberi* is used in the treatment of stomachache in Akbarabad as well as in Hormozgan province, (some of the medicinal properties of this species has been studied in laboratory test, *Cichorium intybus* is used in the treatment of jaundice in Akbarabad as well as in Fasa and Dashtestan [155,156]. Medicinal plants that are being used to treat similar diseases in different places can be regarded as effective drugs [157]. Species such as *Capparis spinosa*, *Peganum harmala* and *Teucrium polium* mentioned in majority of previous studies that show medicinal importance of this species among local people of Iran. Some of medicinal effects of these plants have been studied in laboratory research (*Capparis spinosa*, *Peganum harmala*, *Teucrium polium* [158]. In comparison with previous studies, medicinal species such as *Ducrosia anethifolia*, *Achillea santolinoides*, *Onopordum acanthium*, *Alhagi pseudalhagi*, *Micromeria persica*, *Amygdalus eburnean*, *Urtica pilulifera* that used in the treatment prevalence disease such as hyperlipidemia and hyperglycemia, this medicinal usage have been reported for the first time of total Species, 32 and 27 of medicinal plants common with Fasa and Dashtestan respectively which could be due to vicinity with region and originated from a common culture [159]. To represent new plant species in this study, we compare this study with 130 of previous studies (Footnote of Table 1). Based on the result, 4 species *Caccinia kotschyi* Boiss. *Convolvulus gonocladus* Boiss. Roth, *Andrachne telephioides* L., and *Medicago rigidula* (L.) All., do not mentioned in previous studies, moreover 45 of the medicinal plants have at least one new medicinal usage that reported for the first time in this paper. Species such as *Cichorium intybus*, *Descurainia Sophia*, *Ricinus communis*, *Glycyrrhiza glabra*, and *Myrtus communis* are medicinal plants that are known for many people of local community of Iran and other parts of world [160-163].

Table 5. Comparative presence-absence matrix for the recorded plant species with previous studies in other region of Iran.

Scientific name	A	B	C	D	E	F	G	H	I	J	K	L
<i>Anethum graveolens</i> L.*	0	0	1	0	0	1	1	0	0	0	1	1
<i>Ducrosia anethifolia</i> Boiss	0	1	0	0	1	0	0	0	1	0	0	1
<i>Echinophora platyloba</i> DC.	0	1	0	0	0	0	0	0	0	0	0	0
<i>Eryngium bungei</i> Boiss.	0	0	0	0	0	0	0	0	0	0	0	0
<i>Ferula assa-foetida</i> L.	0	1	0	0	0	0	0	1	1	0	0	1
<i>Foeniculum vulgare</i> Mill.*	0	1	1	1	0	0	1	1	1	1	0	1
<i>Achillea santolinoides</i> Lag.	0	1	0	0	1	1	1	1	0	0	0	1
<i>Artemisia sieberi</i> Besser	0	1	0	0	1	0	1	0	1	0	0	1
<i>Carthamus oxyacantha</i> M. Bieb.	1	1	0	0	0	0	0	0	0	0	1	0
<i>Centaurea bruguierana</i> Hand.-Mazz.	1	0	1	1	1	1	0	0	0	0	0	0
<i>Cichorium intybus</i> L.*	0	1	1	1	1	0	0	1	0	0	1	1
<i>Echinops endotrichus</i> Rech.f.	0	0	0	0	0	0	0	0	0	0	0	0

<i>Gundelia tournefortii</i> L.	1	1	0	0	0	0	0	1	0	0	0	0
<i>Helianthus annuus</i> L.*	0	0	1	0	0	0	0	0	0	0	0	0
<i>Matricaria aurea</i> (Loefl.) Sch.Bip	0	1	1	0	0	0	1	0	0	0	0	0
<i>Onopordum acanthium</i> L.	0	0	0	0	0	0	0	0	0	0	0	0
<i>Tragopogon collinus</i> DC.	0	0	0	0	0	0	0	0	0	0	0	0
<i>Caccinia kotschyi</i> Boiss.	0	0	0	0	0	0	0	0	0	0	0	0
<i>Descurainia Sophia</i> (L.) Webb ex Prantl*	1	1	1	0	0	1	1	1	1	0	0	1
<i>Raphanus raphanistrum</i> subsp. <i>sativus</i> (L.) Domin.*	0	0	0	0	0	0	0	0	0	0	0	0
<i>Capparis spinosa</i> L.	1	1	1	1	1	1	1	1	0	1	1	1
<i>Convolvulus arvensis</i> L.	1	1	0	0	0	1	0	0	0	0	1	0
<i>Convolvulus gonocladus</i> Boiss.	0	0	0	0	0	0	0	0	0	0	0	0
<i>Ipomoea purpurea</i> (L.) Roth	0	0	0	0	0	0	0	0	0	0	0	0
<i>Cucurbita pepo</i> L.*	0	0	0	0	0	0	0	0	0	0	0	0
<i>Ephedra major</i> Host	0	0	0	0	0	0	1	0	0	0	0	1
<i>Andrachne telephioides</i> L.	0	0	0	0	0	0	0	0	0	0	0	0
<i>Ricinus communis</i> L.*	0	1	1	1	0	1	0	1	0	0	0	0
<i>Alhagi pseudalhagi</i> (M. Bieb.) Desv.	0	0	0	0	0	1	1	1	0	0	0	1
<i>Astragalus crenatus</i> Schultes	0	0	0	0	0	0	0	0	0	0	0	1
<i>Astragalus fasciculifolius</i> Boiss.	0	0	0	0	1	0	0	1	0	0	0	0
<i>Glycyrrhiza glabra</i> L.	1	1	1	1	0	1	1	1	0	0	1	1
<i>Medicago rigidula</i> (L.) All.	0	0	0	0	0	0	0	0	0	0	0	0
<i>Medicago sativa</i> L.*	1	1	1	0	0	1	1	0	0	0	0	1
<i>Fumaria parviflora</i> Lam.	0	0	0	0	1	1	1	1	0	0	0	1
<i>Erodium cicutarium</i> (L.) L'Her. ex Aiton	1	1	0	0	1	0	0	0	0	0	0	0
<i>Juglans regia</i> L.	0	0	0	0	0	0	1	0	0	0	1	0
<i>Mentha longifolia</i> (L.) Huds	0	1	1	1	1	1	1	0	0	1	1	1
<i>Micromeria persica</i> Boiss.	0	0	0	0	1	0	0	0	0	0	0	0
<i>Rydingia persica</i> (Burm.f.) Scheen & V.A.Albert.	0	1	0	1	1	1	0	0	1	0	0	1
<i>Salvia macrosiphon</i> Boiss.	0	1	0	0	0	0	0	0	0	0	1	0
<i>Satureja bachtiarica</i> Bunge	0	0	0	0	0	0	1	1	0	0	0	0
<i>Teucrium orientale</i> L.	1	0	0	1	1	0	0	0	0	0	0	0
<i>Teucrium polium</i> L.	1	1	1	1	1	1	1	1	0	0	1	1
<i>Zataria multiflora</i> Boiss.	1	1	0	1	1	1	1	1	0	0	0	1
<i>Ziziphora tenuior</i> L.	0	1	0	0	0	0	1	0	0	0	0	1
<i>Allium ampeloprasum</i> L.*	0	0	1	0	0	0	0	0	0	0	0	0
<i>Allium ascalonicum</i> L.	0	0	0	0	0	0	0	0	0	0	0	0
<i>Allium cepa</i> L.	0	0	1	0	0	0	0	0	0	0	0	0
<i>Punica granatum</i> L.*	1	0	1	1	0	0	1	0	0	0	0	0
<i>Alcea rosea</i> L.	0	1	0	0	0	0	0	0	0	0	0	0
<i>Malva neglecta</i> Wallr.	0	0	0	0	1	0	0	0	0	0	0	0
<i>Malva sylvestris</i> L.*	0	1	1	0	0	0	1	0	1	1	0	1
<i>Ficus johannis</i> Boiss.	0	0	0	0	0	0	0	1	0	0	0	0
<i>Myrtus communis</i> L.	0	1	1	1	0	1	1	1	0	0	0	1

<i>Papaver macrostomum</i> Boiss. & A.Huet	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Sesamum indicum</i> L.*	1	0	0	1	0	0	0	0	0	0	0	0	0
<i>Plantago lanceolata</i> L.	1	0	1	0	0	0	1	1	0	1	0	1	1
<i>Hordeum vulgare</i> L.	0	0	1	1	0	1	0	0	0	0	0	0	0
<i>Zea mays</i> L.*	0	0	0	0	0	0	0	1	1	0	0	0	0
<i>Portulaca oleracea</i> L.	0	1	1	1	0	0	0	1	1	1	1	1	0
<i>Dionysia revoluta</i> Boiss.	0	0	0	0	1	0	0	0	0	0	0	0	0
<i>Ziziphus jujuba</i> Mill.*	0	0	1	0	0	0	0	1	0	1	0	0	0
<i>Amygdalus eburnea</i> Spach	0	1	0	0	0	1	0	0	0	0	0	0	1
<i>Amygdalus scoparia</i> Spach	1	1	1	1	1	0	0	1	0	0	0	0	1
<i>Rosa × damascena</i> Herrm.*	0	1	1	0	0	0	0	1	0	0	0	0	1
<i>Citrus × aurantium</i> L.*	0	1	1	0	0	0	0	1	0	0	0	0	0
<i>Solanum americanum</i> Mill.	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Daphne mucronata</i> Royle	0	0	0	1	1	1	0	1	0	0	0	0	0
<i>Parietaria judaica</i> L.	0	0	0	0	0	0	0	1	0	0	0	0	0
<i>Urtica pilulifera</i> L.	0	0	1	0	0	0	0	0	0	0	1	0	0
<i>Peganum harmala</i> L.	1	1	1	1	0	0	1	1	1	1	1	1	1

Conservation of medicinal plants

Since the uncontrolled harvests of medicinal plants growing wild are on the rise, management, domestication and protection programs must be improvised to prevent them from extinction [164]. Furthermore, the development of agricultural lands and the construction of rural roads are serious threats to the survival of medicinal plants growing wild. Population growth and the raising public awareness of effective medicinal plants and the excessive harvesting have caused the reduction of some medicinal plants species with high consumption. For example, *Ferula assa-foetida* and *Zataria multiflora* are valuable medicinal plants but due to excessive and mismanagement in harvesting, these are feared to be at the risk of extinction, therefore, with proper management and instructing the local people about the correct harvesting of medicinal plants, preservation of medicinal plants from extinction [165,166].

CONCLUSION

In this study we documented 72 medicinal plants belonging to 33 families and 64 genera that have medicinal usage in Akbarabade village. Importance of this study is in represent medicinal plants with effective treatment in disease such as hyperlipidemia, hyperglycemia. In attention that these problems are prevalent in society mankind, therefore this result can be based for more research in pharmaceuticals industry. Moreover, 36 species are used in the treatment of infection, which, due to the prevalence of antibiotic resistance, with further research can be considered as a suitable alternative to antibiotics. Many of medicinal plants in this study are common with previous study in other parts of Iran that shows value of these medicinal plants in Iranian culture, especially species such as *Capparis spinosa*, *Peganum harmala*, *Teucrium polium* that are necessary more research about this medicinal plants. Of total medicinal plants, %72 of medicinal plants is wild that necessitate the protection of plants against domestic and natural threats. Medicinal plants are valuable sources of medicinal and effective compounds in the treatment of diseases that are widely used locally, but due to scarcity and undercutting, many of these valuable species being endangered. The implementation of management plans for the identification and conservation of these natural resources is essential.

Acknowledgments

We thank Dr. B. Kholdebarin and F. Khajoei Nasab for critically reading an earlier version of the manuscript and valuable suggestions.

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