

Traditional and Ethnobotanical uses of medicinal plants by ancient populations in Khabr and Rouchon of Iran

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ABSTRACT

Ethnobotanical studies are a way to access to traditional knowledge about plants with therapeutic potential. Preservation of this information can be a valuable policy for good usage of natural sources and investigation in this field. The aim of the present work is study of ethnobotany of Khabr and Rouchon region in Kerman province which have widely used as medicinal plants. At the first, the information of the native people regarding the use of medicinal plants such as the indication of use, method of use, and the parts of plant which are used, were documented. The collection of plants takes place by field search method and a sample of each plant was transferred to herbarium center of Faculty of Pharmacy of Kerman (KF) for scientific identification. A number of 50 medicinal plant species are gathered from different localities of Khabr and Rouchon. The most of the medicinal plants belong to Lamiaceae, Apiaceae and Rosaceae families. These medicinal plants have been used mostly for gastrointestinal disorder, respiratory system and as analgesic. Considering the virginity of the studied region and lack of sufficient documents about the other therapeutic effects of these herbs, ethnobotanical studies are helpful. Documentation of these valuable experiences can provide a background for development of pharmaceutical sciences.

INTRODUCTION

Anthropological studies have shown that a large amount of medical knowledge has remained among indigenous tribes around the world never enter into western pharmacology science. The study of how humans behave in a particular culture and the use of endemic plants in this area can be a valuable source of information. In some sources, this Science has been named as ethnobotany (Pardo-de-Santayana *et al.*, 2010). Considering the value and importance of medicinal plants and despite remarkable advances in the pharmaceutical industry and chemistry and synthesis of drugs, scientific and medical communities' attention focused on the use of natural resources, especially medicinal plants. By revealing the adverse effects of chemical drugs, Use of ethnobotanical knowledge has received much attention in modern civilization (Setzer *et al.*, 2006).

According to variability of medicinal plants in Iran, study of traditional applications provides the possibility of further investigation for researchers. Now this issue is studying as ethnobotany in many parts of the world and in some cases, these studies led to the discovery of new drugs and new compounds in medicine and pharmacy (Koduru *et al.*, 2007).

This experience is result of observation and trial and errors that led to productivity gain medicinal plants in various forms. Studies of the use of plants have a long history as the first writings on medicinal plants dates back about 5000 years ago in Sumerian era (Trivedi and Sharma, 2004). But there is not any reported about verbal knowledge and experience that is stored in various local populations. These valuable and unwritten sources are in danger of obliteration and amnesia. In Iran, diverse population of people has been located in many different areas with much cultural diversity and because they have access to diverse vegetation, has valuable experience in the use of medicinal plants which need to study, protection and utilization.

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According to tendency of people to use herbs in these regions and the need for new sources of drugs, the use of local medicinal plants has been studied in Khabr and Ruchun Located in Southwest of Kerman province. Khabr and Ruchun are located in the West of Dehsard Village and south of Koshkuiyeh village. Its local populations have a long history in use of medicinal plants. According to the meteorological stations around the region, a variety of cold and dry climates, dry, temperate, arid, hot desert, with mild to moderate influence on the region. This diversity creates different ecosystems that involve diverse vegetation of arid and semiarid forests at altitudes ranging between 3850-1000 meters above sea level (Sharififar *et al.*, 2014). The area under the study, (28°25' N, 56°38' E) with an area of 169170 Km² and height of 1040-3890 m, allocated in the south west of Kerman (fig. 1). The average annual temperature is about 25.5°C. The lowest annual rainfall is related to the southern part of the region (83.4mm) and the most annual rainfall is related to the northern part with 142 mm. Khabr National Park, on the slopes of Khabr mountain with an altitude of 3851 m, has been recorded on the UNESCO World as a wildlife sanctuary, because of biodiversity due to the high altitude and diverse catchment areas. Geologically, study area rocks are made of sand; limestone schist, salt formation, gray limestones and limestones can be crystallized. The study area has long been taking to consideration by the botanists and Zoologists (Sharififar *et al.*, 2014). Edmondson and Miller in 1975 and 1977, have been studied vegetation of area and reported more than 220 plant species from this region in 1980 (Edmonston J 1980). In another report by Pourmirzaii *et al.* (1373) 380 plant species have been introduced. Iran-Nejad *et al.*, (1383) have been reported 451 species from the area (Sharififar *et al.*, 2014). Rajaei and Mohamadi (2012) reported the traditional uses of 92 species belonging to 35 vascular plant families and 78 genera from Hezar mountain (SE of Iran) (Rajaei and Mohamadi, 2012)

EXPERIMENTAL

In order to initial investigation, the geographic Study area map in scale of 1: 30,000 was prepared from the Agricultural Research Organization of Kerman. In order to find the location of

the study area we used the topographic maps. Sampling was done according to the weather, climate and vegetation season. Collecting the specimens was conducted in the second half of July until early September. We employed random sampling techniques to identify potential participants and interviewed a total of 85. Profiles of interviewee are presented in Table 2. The women had better knowledge about the medicinal application of plants than men (76.2%). Most people interviewee was in the range 70-61 years old and 60-51 years old and 61.9% of them were illiterate. The data were collected through direct interviews. A questionnaire was administered to the local people (Mainly residents of Dehsard and Koshkuiyeh). The interviews consisted of obtaining the information related to the identification of plants, their vernacular names, their medical uses and the preparation of remedies. The plant samples were recognized according to credible sources (Mozafarian, 2008, Ghahreman, 1378-1999) and kept in the Herbarium of Pharmacy department, Kerman University of Medical Sciences (KF).

RESULTS

In this research a total of 50 species belonging to 18 vascular plant families and 80 genera were reported. The largest number of medicinal species came from Lamiaceae (22%), followed by Apiaceae (14%), Rosaceae (12%), Papilionaceae (10%), Asteraceae and Ephedraceae (6%) and the remaining 30% are other plants in 12 families (Figure 1).

According to the results, the largest genus of plants was belonging to Ephedra with 3 species that represent significant biodiversity of the study area. These plants are used especially for digestive and respiratory diseases and then sedative, respectively (Figure 2). The results showed that the most widely used medicinal plant part was leaves and stem (26%) followed by flowers (22%), fruits (18%), seeds (9%) and gum (8%), bulk (4%), roots (3%) (Figure 3).

The most common method of herb preparation was decoction (46%) and followed by oral (19%), poultice (18%) infusion (17%) (Figure 4).

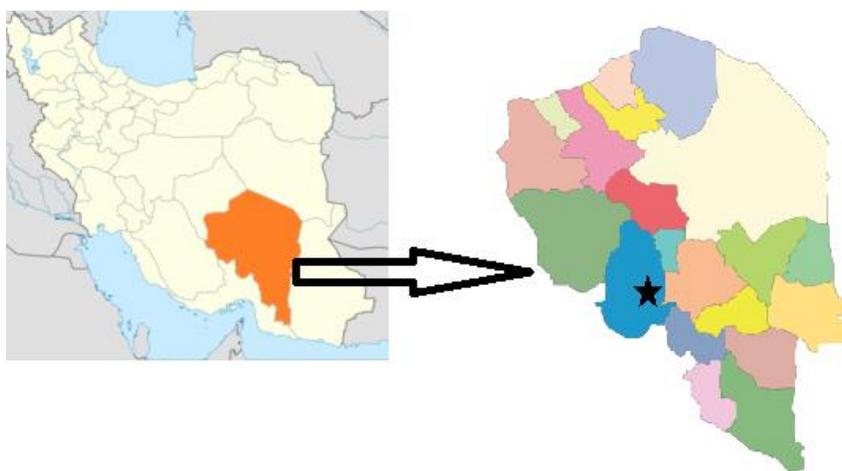


Fig. 1: Location of study area in Iran.

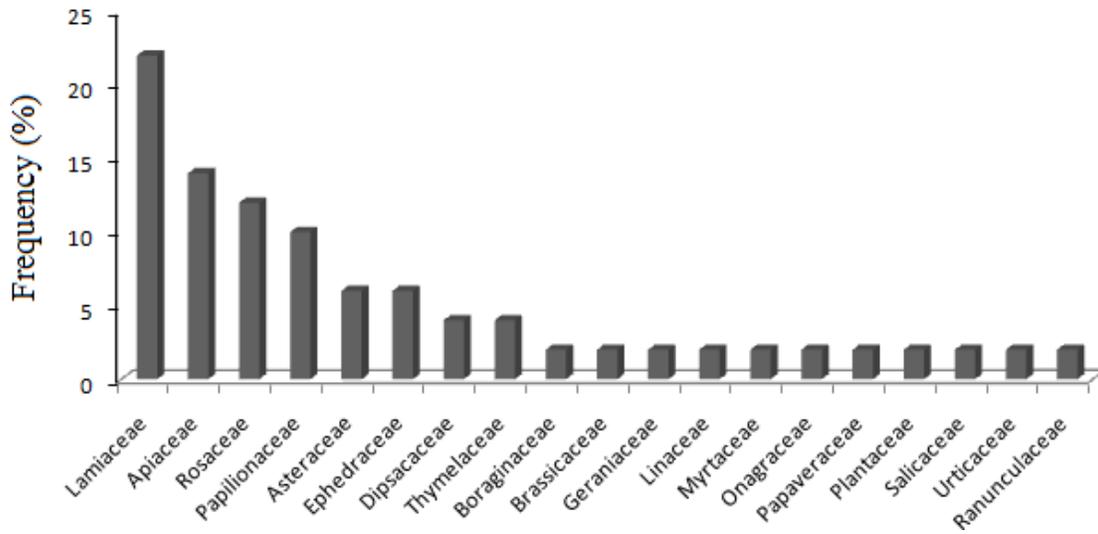


Fig. 2: Frequency (%) of medicinal plants based on plant families.

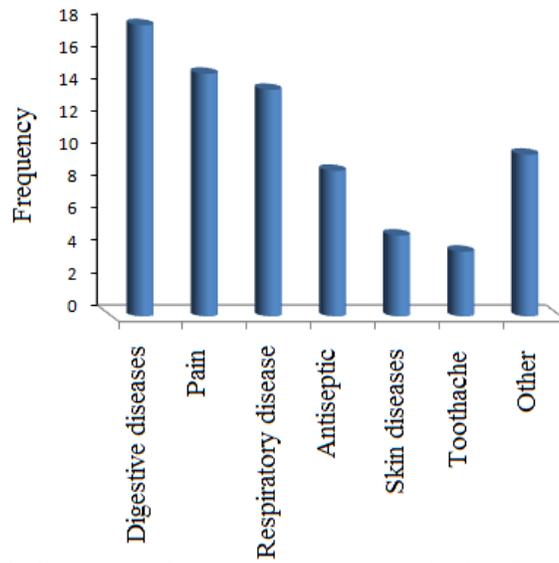


Fig. 3: Frequency of plants used in the treatment of various diseases.

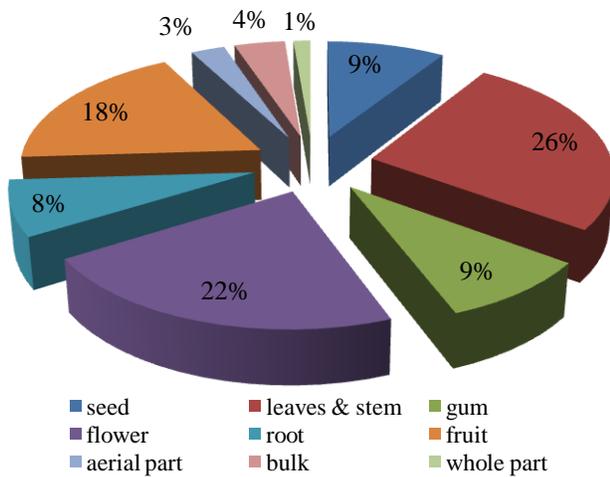


Fig. 4: Parts of plant used.

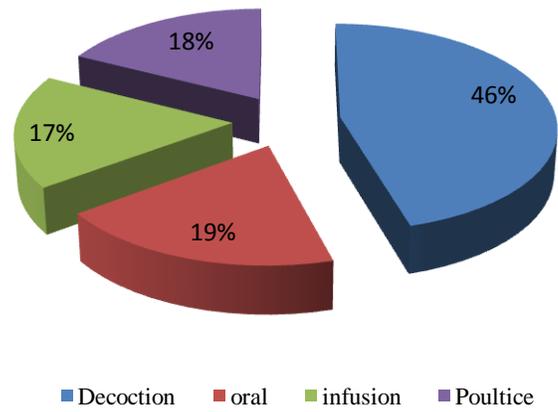


Fig. 5: Different methods of preparation

Table 1.List of medicinal plant species and medical health data in Khabr and Rouchon region in Kerman province.

No	family	Scientific name	Herbarium No.	Persian name	Local name	Uses	Preparation	Altitude (m)	Part used
1	Apiaceae	<i>Bunium persicum</i> (Boiss.) B. Fedtch.	KF1141	<i>Zirehkermani</i>	<i>Zirehsiah</i>	Removal cold temper· strengthen the stomach, Treatment of general weakness	Decoction	2400	Seed, The young leaves and stems
2		<i>Dorema ammiacum</i> (D.Don.)	KF1118	<i>Vasha</i>	<i>Kama eshterk</i>	Healing infected wound and infection, Acne and abscess	Poultice	2700	gum
3		<i>Dorema aucheri</i> Boiss.	KF1201	<i>Kondolkuhi</i>	<i>Kama, eshterk, balhareshterk</i>	Healing infected wound and infection,	Poultice, oral	3100	gum
4		<i>Ducrosia anethifolia</i> (DC.) Boiss.	KF1201	<i>mashkak</i>	<i>rashkak</i>	Gasteralgia, Food consumption	Decoction	2300	seeds
5		<i>Ferula oopoda</i> Boiss.	KF1148	<i>Kama ghalafdar</i>	<i>Kaljashoor</i>	Toothache, Tooth infection	oral	2400	Gum
6		<i>Ferula ovina</i> Boiss.	KF1098	<i>Kama</i>	<i>anghuzeh</i>	Antiseptic tooth	poultice	1700-3000	Gum
7		<i>Levisticum officinale</i> W.D.J. Koch	KF1099	<i>Anjedan</i>	<i>karasm</i>	Gastrointestinal disorders caused by coldtemper, Gout, anemia in young girls	Infusion	3200	Leaves
8	Asteraceae	<i>Achillea eriophora</i> DC.	KF1111	<i>Bumadaran</i>	<i>bumadaran</i>	Anti-colic, anti-diarrhea and cramping, Carminative, stomach problems, menstrual cramping	Decoction	1600	leaves, Flowering branches
9		<i>Cichorium pumilium</i> Jacq.	KF1100	<i>Kasni pa kutah</i>	<i>kasni</i>	heat stroke, liver failure	Concentrated Decoction	2300	roots
10		<i>Hertia intermedia</i> (Boiss.) O. Kuntze	KF1105	<i>Karghich</i>	<i>Kalghich, karkich</i>	insect sting, Toothache	poultice	3200	Leaves, Gum
11	Boraginaceae	<i>Onosma stenosphon</i> Boiss.	KF1198	<i>Zanghooleibarik</i>	<i>havachueh</i>	anti- infection postpartum, Inflation and contusion, headaches	Decoction - Poultice	2300	roots
12	Brassicaceae	<i>Fortuynia garcinii</i> (Burm.) Shuttlew.	KF1101	<i>Shab boo biabanigarmsiri</i>	<i>mokhalase</i>	snake bite	Decoction- oral	1700	Leaves, flowers
13	Dipsacaceae	<i>Scabiosa Candollei</i> Wall. ex DC.	KF1228	<i>Toosakkermani</i>	<i>Sarbanafshetalkh</i>	pain in the joints, Antidiarrheal	Poultice with oil - Infusion oral	1400-3000	flowers
14		<i>Scabiosa flavida</i> Boiss. & Hausskn.	KF1107	<i>Toosakbehbahani</i>	<i>Sarbanafshetalkh</i>	Skin diseases, bronchitis treatment, blood purification	infusion	1500-2000	flowers
15	Ephedraceae	<i>Ephedra distachya</i> L.	KF1126	<i>Ormakdoradifi</i>	<i>hoom</i>	Stomach ulcers and stomach irritation	Decoction	2200	fruit, Young branches
16		<i>Ephedra pachyclada</i> Boiss.	KF1127	<i>Hoom, hooma</i>	<i>Rang hoomnar</i>	Asthma, Making Mashk from animal leather	Decoction	2200	fruit, Young branches
17		<i>Ephedra procera</i> Fisch. Et Mey.	KF1162	<i>Ormak, rishboz</i>	<i>alijun</i>	Cough suppressants and antipyretic	Decoction	2150	Fruit, Young branches
18	Geraniaceae	<i>Biebersteinia multifida</i> DC.	KF1258	<i>Adamak, bahmansorkh</i>	<i>Pichbahman</i>	Abdominal pain, diarrhea, leg pain and back pain, sedative	infusion	3100	roots
19	Lamiaceae	<i>Acinus graveolens</i> (M.B) Link.	KF1412	<i>Avishanak</i>	<i>malangoo</i>	Chest pain, dry Cough suppressants, mucus	Decoction	2100	Fruit, seeds
20		<i>Ajuga chamaecistus</i> Ging. Subsp. <i>Chamaecistus</i>	KF1247	<i>sepidmashkak</i>	<i>samsak</i>	Removing lice from the hair of children, stomach problem	Poultice	2400	Leaves, Flowering branches
21		<i>Dracocephalum polychaetum</i> Bormm.	KF1128	<i>Badranjbuyekermani</i>	<i>Mafaroo, zaroo</i>	Rheumatic pains, Has a hot temper,	Decoction	3700	Leaves, Flowering branches
22		<i>Lallemantia royleana</i> Fisch.	KF1110	<i>Balengoo</i>	<i>malangoo</i>	Chest pain, pneumonia, cough, mucus	infusion	2100	fruit, seeds
23		<i>Leonurus cardiaca</i> L.	KF1129	<i>Domshir</i>	<i>domshir</i>	Asthma, Constipation	Decoction	2600	Aerial parts
24		<i>Nepeta bracteata</i> Benth.	KF1251	<i>Poonhsabargdar</i>	<i>zufa</i>	Cold	Decoction	2400-2700	
25		<i>Otostegia persica</i> (Burm.) Boiss.	KF1238	<i>kasegol</i>	<i>goldar</i>	toothache, tooth stun	Decoction, oral	1700-2200	leaves
26		<i>Salvia mirzayanii</i> Rech. f. & Esfand	KF1112	<i>Maryamgolikarvandari</i>	<i>morporzoo</i>	Digestive disorders and indigestion, Stomach ache	Decoction 3 infusion	1570	Leaves
27		<i>Salvia sclarea</i> L.	KF1130	<i>Maryamgoli</i>	<i>morshak</i>	Antiseptic, Menstruate	Decoction	1700-2600	Leaves 3 Flowering branches
28	<i>Stachys inflata</i> Benth.	KF1240	<i>Sonboleiarghavani</i>	<i>golmorshak</i>	Fever, Faint	Decoction	2300	Leaves 3 Flowering branches	
29	<i>Zataria multiflora</i> Boiss.	KF1241	<i>Avishanshirazi</i>	<i>Avishan -Apishan</i>	Back pain, anti-cramping caused by digestive problems, cold	Decoction	1800-2200	Leaves 3 Flowering branches	

30	Linaceae	<i>Linum usitatissimum</i> L.	KF1115	<i>Katan</i>	<i>katan</i>	Inflammation, abscesses, ulcers or burns	Poultice	3000	seeds
31	Myrtaceae	<i>Myrtus communis</i> L.	KF1356	<i>Moord</i>	<i>moordaneh</i>	Sedatives, cold, Underarm malodor	Decoction	1700-2000	Leaves,fruit
32	Onagraceae	<i>Epilobium angustifolium</i> L.	KF1005	<i>Bid alafighari</i>	<i>Bid alafi</i>	Inflammation of mouth, Blister, wound,	Poultice	1900-3000	Leaves +roots
33	Papaveraceae	<i>Papaver dubium</i> L.	KF1259	<i>Khashkhashharz</i>	<i>Teryaksheitan</i>	Sedative and analgesic, anti-inflammatory, Pustules		1900	Flowers,fruit
34		<i>Alhagi pseudalhagi</i> (M.B.) Desf.	KF1009	<i>Kharshotor</i>	<i>kharshotoradoor</i>	Kidney inflammation, diarrhea	infusion	1700-1900	Aerial part
35		<i>Colutea persica</i> Boiss.	KF1032	<i>Daghdaghak</i>	<i>Derakhtkkeh</i>	Purgative and emetic	Decoction	330	Leaves and seeds
36	Papilionaceae	<i>Glycyrrhiza glabra</i> L.	KF1273	<i>shirinbayan</i>	<i>Motki, shirinbayan</i>	Sedative, Gastritis, Pain and swelling of Luxation	Decoction	1900-2300	root
37		<i>Ononis spinosa</i> L.	KF1072	<i>Kharkhar</i>	<i>kangar</i>	Weight loss	oral	2500-3000	roots +Leaves, flowers
38		<i>Sophora mollis</i> (Royle) Graham ex Baker.	KF1070	<i>Talkhebayanbaghi</i>	<i>talkhe</i>	Irregularities gallbladder, laxatives	Decoction	220	roots +, seeds, leaves
39	Platanaceae	<i>Platanus orientalis</i> L.	KF1170	<i>chenar</i>	<i>chenar</i>	Skin rash, hoarseness and snakebite	Washing with soaked - Decoctionoral	2100	Fruit,leaves,, roots, bulk
40	Ranunculaceae	<i>Thalictrum minus</i>	KF1000	<i>Sodabibargi</i>	<i>sedreh</i>	Cough, Mucus	Decoction	2400	Leaves, Flowering branches
41		<i>Agrimonia eupatoria</i> L.	KF1282	<i>Ghafez</i>		Wound healing,Liver disease, fatty liver	Decoctionoral	2600	Whole parts
42		<i>Amygdalus communis</i> L.	KF1242	<i>Badamshirin</i>	<i>Badamshirin</i>	Leaves in the treatment of wounds +Fruit:mucus, whooping cough treatment	infusion	2600	bulk +fruitseed, flower+ leaves
43	Rosaceae	<i>Amygdalus eburnean</i> Spach.	KF1285	<i>Badamkhoohi</i>	<i>archan</i>	Laxative and purgative, Prevent Hair Loss	infusion	2000	Fruit, Gum
44		<i>Amygdalus scoparia</i> Spach	KF1284	<i>Badam</i>	<i>Badamkhoohi, badamtalkh</i>	Hair Loss,	Poultice	2200	fruit, Gum
45		<i>Cotoneaster kotschyi</i> (C.K. Schneid.) G. Klotz	KF1200	<i>Shirkheshtekermani</i>	<i>siahchoo</i>	asthma	oral	3200	fruit
46		<i>Cotoneaster persica</i> Pojark.	KF1092	<i>Shirkhesht</i>	<i>siahchoo</i>	asthma	oral	3200	fruit
47	Salicaceae	<i>Populus alba</i> L.	KF1261	<i>Sepidar</i>	<i>sepidar</i>	Diuretic and emetic	Decoction with honey	2800	Leaves, bulk
48	Thymelaeaceae	<i>Daphne mucronata</i> Royle	KF1019	<i>Bargeboozagrosi</i>	<i>Termangoo, terbit</i>	Laxative and purgative	oral	1800-2500	fruit
49		<i>Daphne stapfii</i> Bornm.& Keissler	KF1198	<i>Bargebookermani</i>	<i>Termangoo, terbit</i>	Laxative and purgative	oral	2500-2900	fruit
50	Urticaceae	<i>Urtica urens</i> L.	KF1291	<i>Gazaneh sag</i>	<i>suznakoo -suzanoo</i>	Rheumatism	Decoction	3100	Fresh leaves

Table 2: Personal characteristics of interviewees.

Variable	gender		Age						education		
	male	23.8	20-30	31-40	41-50	51-60	61-70	>70	illiterate	Low literacy	others
Frequency (%)	female	76.2	9.52	9.52	9.52	28.57	33.34	9.52	61.9	19.05	19.05

DISCUSSION

The use of medicinal plants is a special place in Iranian culture. Traditional beliefs of the people, for the safety of medicinal plants and a vast source of natural resources have provided a good platform for the use of medicinal plants in Iranian medical system. Our results showed Lamiaceae, Apiaceae, Rosaceae, Papilionaceae, Asteraceae and Ephedraceae are the most medicinal plants used in this area. A number of medicinal plants such as *Achillea*, *Cotoneaster*, *Lallemantia*, bitter almonds, *Tragopogon* and *Ajugahave* been repeated by many of the native people. The results of this study showed similarities to some previous reports but in some cases were different, for example, it could be noted to the well-known medicinal herb thyme (*Zataria multiflora*) which has been reported to possess antioxidant, anti-bacterial, anti-cholinesterase, analgesic and anti-inflammatory effects in literatures (Sharififar *et al.*, 2007;2011, Hosseinzadeh *et al.*, 2000). This plant is used to the treatment of pain caused by digestive disorders by the native people of the region. In other cases it can be noted to the reduction effects of blood sugar of *Ephedra distachya* (Konno *et al.*, 1985). While local uses of the plant *Achillea eriophora* has been studied in fewer resources and only the analysis of the chemical composition of essential oil has been reported (Ghani *et al.*, 2008). *Ferula oopoda* is another plant that needs to be more studies. It is often seen on the northern snow slopes in mountainous and cold regions of the province. There are no reports in the literature regarding the therapeutic effects of it (Serkerov *et al.*, 1991). In traditional medicine, the people of this area used *Ferula oopoda* as a sedative digestive pains. *Sophora mollis* is used for gallbladder disorders, and also for as a laxative. Anti-malaria effects have been reported in the literature (Zhang *et al.*, 2009). In general, the main uses of medicinal plants in study region were in the treatment of gastrointestinal disorders, respiratory system and also many of them have analgesic effects. A significant number of these plants have been used in both respiratory and gastrointestinal disorders (more than 20% of cases) (figure 2). Therapeutic Uses of respiratory disorders is included cough and mucus. Some of these use cases, as has been pointed out by local people. For example, use of *Ephedra spp* for the treatment of gastrointestinal disease and stomach ulcers, *Acinus graveolens* to relieve dry cough and mucus that has also been referred to the use of this plant in traditional medicine of Morocco (Lyoussi B 2000). Another example is the use of *Dorema aucher* to treat wounds, infections and abdominal pain. This plant in Boyer Ahmad ethnobotany used in the treatment of gastrointestinal infections (Mosaddegh *et al.*, 2012). On the other hand, *Drcacephalum polychaetum* used as a poultice to relieve rheumatic pains, and eliminate problems caused by the cold tempered in this area. The use of *Agrimonia eupatoria* is recommended for the treatment of liver disorders, especially fatty liver. Many studies have been done on this herb in other parts of the world and the effects of antioxidant, antibacterial and protects the liver of it has been confirmed (Copland *et al.*, 2003; Yoon *et al.*, 2012). There is no report on the therapeutic effects of this

valuable plant in Iran but now the biologic effects of this plant is being studied in the School of Pharmacy of Kerman. Due to the rugged parts of the region, it was not possible to achieve all the plants and their information so this investigation has reported only 50 species and many medicinal plants have not been identified and their ethnobotanical study have not been done in this area. In floristic and vegetation study of this area, the tropical region has been investigated more than (Sharififar *et al.*, 2014). Due to the presence of different climates in Iran, there is different variety of vegetation. On the other hand, because of the existence of different ethnic groups there is a wide variety of different traditions and various ways of local therapies. Numerous studies have been conducted on ethnobotany of various regions of Iran. In a study a total of 21 species belonging to Lamiaceae and Rosaceae family have been reported in Alamutmt., that a number of them, was the endemic of that area. Number of similar species of this study has also been reported from the region of Alamut (Ahvazi, 2007). A similar study was carried out in Sirjan and 79 species have been reported, some of the plants was similar to the results of this study. But plants such as *Adiantum capillus-veneris*, *Anethumgraveolens*, *chrysanthemum* and *Antirrhinum majus* have not been reported in flora of Khabr and Rouchon (Sharififar, 2010, Sajadi, 2011). Iranmanesh *et al.*, have reported a total of 30 species that their most important plants are aloe vera, eucalyptus, *Ziziphus jujube* and *Citrullus* (Iranmanesh, 2010). Mahdavi and Myrtadzadini (Meymand, 2006) have reported a total of 30 medicinal plants in Shahrabak (West of Kerman). In the above study most plants belonging to Asteraceae and Caryophyllaceae family that was different from recent study. In total, according to available reports, we can use the mentioned medicinal plants in the preparation of various products for the pharmaceutical industry, food industry, new cosmetic it needs to proper management, systematic planned and Pharmacological and biological studies. According to the presence of the old villages with a long history of medicinal use in different parts of Iran, the results of this investigation and similar studies confirm the need for more research. This valuable pharmaceutical information may be forgotten over time.

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