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# Traditional and local use of medicinal plants by local communities in Hezar Jerib summer area, north of Iran

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## ABSTRACT

**Background & Aim:** Some knowledge about medicinal plants is available in old references or books. But important point is the information of traditional usage of medicinal plants from different parts of Iran will be worthwhile and in addition to encouraging people to it provides a good background for future examination about medicinal plants. The objectives of this study is to identify the medicinal plants along with local names, utilized parts, administration route, ailments treated, therapeutic effect and preparation methods.

**Experimental:** So to get this information, we use semi-structured interviews. This research was conducted in the summer and spring of 2016. During this period around 150 individuals (75 men, 75 women; in an age group between 20 and 95 years) were interviewed in 6 villages. Number of questions in this survey was 15 questions. Ethno botanical data were analyzed by use-reports. In addition important indices like Informant Agreement Ratio (IAR), Relative Frequency of Citation (RFC) and Cultural Importance (CI) were calculated. Furthermore, a traditional null hypothesis testing was adopted. These are the most popular indices in quantitative ethno botany.

**Results:** A total of 54 medicinal plants belonging to 22 families were identified. The most common families are Lamiaceae, Asteraceae, Apiaceae and Rosaceae, with 22, 17, 5 and 4%, respectively. The most common preparations methods were infusion (52%), eaten raw and decoction (13%). Also, between different parts of the plant, the leaves are mostly used. According to RFC and CI indices, the most important plant is *Gallium verum*. Nervous disease has the highest Informant Consensus Factor value with the rate of 0.80.

**Recommended applications/industries:** Introduction of medicinal plants in each region, along with their use can be a great help to create jobs and Encouraging people to cultivate these plants.

## 1. Introduction

Ethnobotanical studies are very important to tell the past and present culture about plants in the world (Bulut & Tuzlaci, 2013). About 80% of human in the world use plants to treat several diseases (UICN, OMS, WWF, 1993). Medicinal plants were main source of treatment but now, after advances in medical science, they are an important source of current drugs and around 25 % of the drugs prescribed worldwide come from plants (Rates, 2001). Tetik *et al.*, (2013), Communities like, Ayurvedic, Kampo, Unani, Jamu, Iranian, Aztec are known as prominent examples of ethnobotany in medicinal plants. However, in unknown communities, there are not historical document in Traditional knowledge of medicinal plants, so our information is based on investigators efforts to document these knowledge (Heinrich, 2010).

In rural and poor societies, the use of medicinal plants is a valuable resource and necessity, and furthermore they provide some real alternatives for primary health care systems (Hayta *et al*., 2014). According to WHO, the international market of herbal products is estimated to be US $62 billion which is poised to grow to US $5 trillion by the year 2050 (WHO, 2002).

Historical document illustrate the fact that Iranian have depth knowledge in using the medicinal plants (Zargari, 1989–1992). Khajoei Nasab & Khosravi (2014) concluded that Lamiaceae is the largest family that is used to treat various ailments and these plants are often used as decoction.

Ethnobotanical surveys were done in the Turkmens of Golestan and Khorasan Province for the first time and in this study, 136 species from 51 families were documented by Ghorbani (2005). After that, several researchers conducted survey about medicinal plants in other parts of the country (Ghollassimood, 2008; Dolat khahi *et al*., 2010; Iran manesh, 2010; Sharifi far *et al*., 2010; Mosaddegh *et al.*, 2012; Safa *et al*.,2013). Naghibi *et al.*, (2005) represented 46 genus and 410 species from Labiatae family in Iran that many members of this family were used in traditional and folk medicine.

Naghibi *et al*., (2014), fulfilled their research by semi-structured interview and concluded that Asteraceae and Fabaceae were the dominant locally used families. Mosaddegh *et al*. (2016), conducted a study in the highland of Alvand and Tuyserkan, and concluded that the most treated ailments were digestive problems and *Stachys lavandulifolia* and Thymus *lancifolius* have the highest indices of RFC and CI.

Although the present study is not the first ethnobotanical survey in Hezar Jerib area, but there are gaps in ethnobotanical knowledge in this region. The aim of this study is to document and investigate the traditional use of medicinal plants by local people and keeping this type of information in mind and Databases to study further on the other applications of plants, this study was conducted from December 2014 to September 2015. According to the gathered information from local people, there were more medicinal plants in Hezar Jerib region which extinct due to Land Use change and excessive harvesting and this study seems to be useful in identifying the helpful plants and keeping their records for the future investigations.

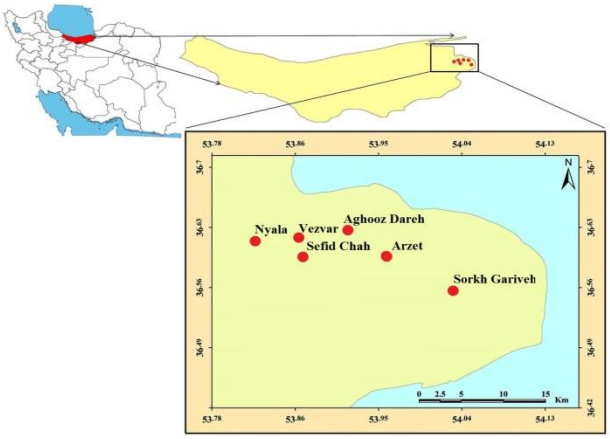


**Fig. 1**. Map of Iran showing Mazandaran Province and Hezar Jerib Summer area

## 2. Materials and Methods

### *2.1. Study area*

Hezar Jerib district consists of 6 villages, encompasses an area of 14528 ha, and has a total population of 11017 inhabitants. Hezar Jerib Summer Rangeland is located (36°24’18”– 36°34’22” N, 53°58’16”– 54°03’48” E) in the North part of Iran and Its altitudinal range is between 1600-2800 MASL, and Including; Nyala, Vezvar, Sefid Chah, Aghooz Dareh, Arzet, Sorkh Geriveh villages (Fig. 1). Hezar Jerib

Summer Rangeland has a semi-arid climate with dry and cold winter and moderate and dry summer. The average annual temperature, average humidity and average rainfall in this city are about 12.44 ° C, 185 mm and 383 mm, respectively. Soil pH is about 7.

### *2.2. Field survey and data collection*

In our study, we used semi-structured interviews (Rehecho *et al.*, 2011) in order to collect information about how they use medicinal plants, and for which disease treatment. During this period (about 8 months) around 150 individuals (75 men, 75 women; in an age group between 20 and 95 years) were interviewed in 6 villages. Interviewees were shepherds, Farmers and other people, also we asked detailed questions on medicinal uses of plants in places like farmlands, gardens and Mosques. Interviews and questionnaires in this study continued until the duplicate answers were heard, and then the interview would not add a new point to the notes. During the interviews, demographic characteristics of the study participants, and local names, utilized parts, administration route and preparation methods of the plants were recorded. In this study, Use report, Number of use, Frequency of Citation, Relative frequency of citation and Cultural Importance Index were recorded for each plant.

### *2.3. Data analysis*

Indices such as IAR, RFC and CI which are the most popular indices in quantitative ethno botany (Albuquerque & Lucena, 2005) were used in this study. Informant consensus factor was calculated according to the following formula (Trotter & Logan, 1986):

$$IAR = \frac{NUR - NT}{NUR - 1}$$

Nur and NT indicate the number of use reports for each ailment and the number of species that are used, respectively. IAR value ranges from 0 to 1.1 indicates more informants use the same species for treatment of the same diseases while 0 indicates informants do not exchange information about their use (Inta *et al.*, 2013).

Relative Frequency of Citation (RFC) calculated by the following formula: FC is the number of informants mentioning the use of the species and N is the total number of informants (Tardio & Santayana, 2008):

$$RFC = \frac{FC}{N}$$

The Cultural Importance Index (CI), calculated by the following formula (Tardio and Santayana, 2008). This index is based on diversity of use.

$$CI = \sum_{u=u1}^{uNC} \sum_{i=i1}^{iN} URui/_{N}$$

## 3. Results and discussion

150 people were interviewed in this survey and 54 specimens belonging to 22 families were collected in the research area. The experiences of the study participants were recorded during the interviews. Information about the local names of the plants, their uses and parts of the plants that used to treat ailment are listed in table 1.

Most of the medicinal plants used in this area belong to the Lamiaceae with 15 species and the most commonly used plant species are *Achillea* and *Apium* with 3 species (Fig. 2). Hosseini *et al.*, (2009) conducted a similar study in Golestan province and Stated that Lamiaceae have highest number of medicinal plants species that used by local people.

Other researchers such as Dolatkhahi *et al.*, (2010), Mosaddegh *et al.*, (2012-2016), Safa *et al.*, (2013), Rajaei *et al.*, (2012), Sharififar *et al.*, (2014) and Naghibi *et al.*, (2014) indicated Asteraceae and Lamiaceae were the most used families.

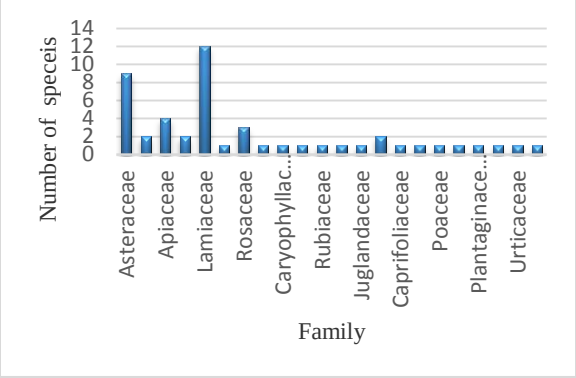


**Fig. 2.** The Number of medicinal species in each family

**Table1.** Folk medicinal plants of Hezar Jerib area

| Family/botanical name/ voucher number | Local name | Plant part used | Preparation | Administration route | Ailments treated, therapeutic effect |
|---|---|---|---|---|---|
| Asteraceae *Achillea wilhelmsii* C. Koch HJ-101 | Bomadaran alborzi | Flowering branches | Infusion | Oral | flatulence, carminative, pyretic |
| Asteraceae *Achillea biebersteinii* Afan HJ-102 | Bomadaran (Parcham javan ) | Flowering branches | Infusion | Oral | flatulence, stomachache and skin wound healer |
| Asteraceae *Achillea millefolium* L. HJ-103 | Bomadaran | Flowering branches | Infusion | Oral | Carminative, Cold, expectorant, Urinary tract |
| Asteraceae *Anthemis persica* Boiss. HJ-107 | Babooneh | Flowers | Infusion | Oral | Increased immunity, expectorant |
| Asteraceae *Artemisia vulgaris* L. HJ-109 | Darmaneh | Leaves, Flowering branches | Infusion | Oral | Appetizer, digestion, regulate menstruation and disinfectants. |
| Asteraceae *Artemisia annua* L. HJ-110 | Darmaneh (Gandevash) | Young branches | New water plant, Leaf poultice | Oral | Relieve Children ear pain and leg pain |
| Asteraceae *Cichorium intybus* L. HJ-113 | Kasni | Root | Infusion, Poultice | Oral | Disinfection of the digestive system |
| Asteraceae *Tanacetum parthenium* (L.) Sch.Bip. HJ-144 | Babooneh | Leaves, Flowers | Infusion, Decoction | Oral, Inhalation | Nourishing effect, stomach tonic, convulsion, diarrhea, Febrifuge, disinfectants |
| Asteraceae *Traxacum vulgare* (Lam.) Scrk HJ-145 | kangar | Aerial parts, Roots | Infusion, Decoction | Oral | Blood purifier |
| Apiaceae *Apium graveolens* Cham. HJ-108 | Karafs koohi | Leaves | Eaten raw | Oral | Febrifuge |
| Amaryllidaceae *Allium paradoxum* (M.Bieb.) G.Don HJ-104 | Piaz zangulehi | Fruit | Eaten raw | Oral | Regulators of cholesterol and high blood fats, Power increasing for body and digestive system and circulatory system |
| Amaryllidaceae *Allium Akaka* S.G.Gmel. ex Schult. & Schult.f. HJ-105 | Piaz zangulehi (Elleh zi) | Bulbs and Leaves | The leaves are crushed | Oral | Blood purifier, Blood pressure |
| Amaryllidaceae *Allium sativum* L. HJ-106 | Piaz zangulehi | Bulbs and Leaves | Eaten raw, Decoction | Oral | Blood cholesterol, digesting food, regulating the digestive system |

| | | | | | |
|---|---|---|---|---|---|
| Apiaceae<br>*Eryngium caucasicum* Trautv<br>HJ-121 | Zoleng (Sisketeli) | leaves | Eaten raw | Oral | Pain killers, appetizer |
| Apiaceae<br>*Ferula persica* Willd.<br>HJ-122 | Barijeh (Ashteghaz) | Gum and resin | latex | Topical | expectorant, spasmodic, carminative |
| Apiaceae<br>*Heracleum persicum* Desf.<br>HJ-125 | Golpar (Kolek par) | leaves, Seed | Decoction, Infusion | Inhalation | Diuretic |
| Berberidaceae<br>*Berberis vulgaris* L.<br>HJ-112 | Zereshk | Root, Shoot, Leaves, flower, Fruit | Eaten raw, Dry plant, Decoction, Infusion | Oral | Febrifuge and laxative |
| Brassicaceae<br>*Descurainia Sophia* (L,) Schur<br>HJ-118 | Khakeshir | Seed | Infusion | Oral | Febrifuge, constipation, sunstroke |
| Boraginaceae<br>*Echium amoenum* Fisch. & Mey.<br>HJ-120 | Gol gavzaban (Eshko) | Flowers | Infusion | Oral | Stress pressure, expectorant, Febrifuge |
| Caryophyllaceae<br>*Dianthus orientalis* Adams<br>HJ-119 | Mikhak | Bud | Infusion, Additive to foods and eaten raw | Oral, Inhalation | Headache, asthma, liver and kidney, Hiccup and appetizing |
| Caprifoliaceae<br>*Lonicera floribunda Boiss et Buhse* HJ-131 | Pich aminodole (Peche) | Leaves, Flowers, stem skin | Fruit, Leaves, Flower | Oral | Constipation, Bronchitis, Flu |
| Cornaceae<br>*Cornus australis* C.A.Mey.<br>HJ-115 | Zoghal Akhteh | Fruit and stem skin | Eaten raw | Oral | Febrifuge |
| Cupressaceae<br>*Juniperus communis* L.<br>HJ-128 | Ors (balesh khers) | Leaves, fruits, Twigs and wood | Decoction, Infusion | Oral | Blood purifier, Diuretic |
| Cupressaceae<br>*Juniperus Sabina* L.<br>HJ-129 | Ors (May maraz) | Leaves, fruits, Twigs | Leaves and Fruits are crushed | Inhalation | Wart |
| Guttiferae<br>*Hypericum perforatum* L.<br>HJ-126 | Metameti | Flowering branches | Infusion | Oral | Stress pressure |
| Juglandaceae<br>*Juglans regia* L.<br>HJ-127 | Gerdo | Leaves, Fruits | Infusion | Oral, Inhalation | Diabetes, Hair protects, Lipid-lowering |
| Lamiaceae<br>*Mentha persica* Benth.<br>HJ-135 | Pooneh (petenek) | Leaves | Infusion | Oral | flatulence, Stomachache |
| Lamiaceae<br>*Nepeta pungens* (Bunge.) Benth HJ-137 | Naana | Flowers | Decoction, Infusion, Waiting in olive oil | Oral | Stress pressure |

| | | | | | |
|---|---|---|---|---|---|
| Lamiaceae<br>*Nepeta cataria* L.<br>HJ-138 | Naana | Leaves | Infusion | Oral | Cold, Antipyretic |
| Lamiaceae<br>*Origanum vulgare* L.<br>HJ-139 | Marzanjoosh, Mardghoosh | Aerial parts | Infusion, Gargle | Oral, Inhalation | Appetite stimulants, painkillers, cough and pertussis, asthma and nerve pain, convulsion |
| Lamiaceae<br>*Salvia sclarea* L.<br>HJ-141 | Mayam goli | Leaves | Infusion | Oral | Energy Provider |
| Lamiaceae<br>*Stachys lavandulaefolia* Vahl<br>HJ-142 | Chai koohi | leaves | Infusion | Oral | flatulence, Headaches, Cough, |
| Lamiaceae<br>*Stachys laxa* Boiss. & Buhse<br>HJ-143 | Chai koohi | leaves | Infusion | Oral | Fever and sedatives |
| Lamiaceae<br>*Teucrium chamaedrys* L<br>HJ-145 | Maryam nekhodi (Hizvash alaf) | Young branches | Infusion | Oral | Help for digestion, Relieve constipation |
| Lamiaceae<br>*Teucrium polium* L.<br>HJ-146 | Maryam nekhodi (Hizvash alaf) | Flowering branches | Incense, Infusion, crushed | Oral, Inhalation | Antiseptic, analgesic and inflammation, jaundice, Diabetes |
| Lamiaceae<br>*Thymus kotschyanus* Boiss. & Hohen.<br>HJ-147 | Avishan (oshmak) | leaves | Infusion | Oral | flatulence, expectorant,, cough, headaches and nerve stimulation |
| Lamiaceae<br>*Ziziphora sp.*<br>HJ-150 | Kakooti (Chai choopan) | Inflorescence | Infusion | Oral | Stress pressure |
| Malvaceae<br>*Malva neglecta* Wallr.<br>HJ-132 | Panirak (Melki, Anchelek) | Leaves | Infusion | Oral | Diabetes and high blood pressure |
| Poaceae<br>*Melica persica Kunth.*<br>HJ-134 | Baderanj booye (varengeboo) | Leaves | Infusion | Oral | Stress pressure, heart disease, Gastrointestinal and exhilarating |
| Plantaginaceae<br>*Plantago lanceolate* L.<br>HJ-141 | Barhang koohi (Bartang) | Seeds, Leaves | Infusion | Topical | Cramps |
| Polygonaceae<br>*Polygonum sp.*<br>HJ-140 | Haft band | Aerial parts | Powder, Infusion | Topical | Soothing contusion, Blisters and scorch, Purulent wounds |
| Rosaceae<br>*Fragria vesca* L.<br>HJ-123 | Toot Franagi vahsi | Fruits, leaves and roots | Raw, decoction, jams, syrup | Oral | Diarrhea and diuretic |

| | | | | | |
|---|---|---|---|---|---|
| | | | and ice cream | | |
| Rubiaceae<br>*Gallium verum* L.<br>HJ-124 | Piyaz | Flowering plants, roots | Infusion | Topical, Oral | Diuretic, Nutritious, blood purifier, Anti-toxins, sedative, astringent, Anti-convulsion |
| Rosaceae<br>*Mespilus germanica* L.<br>HJ-136 | Azgil | Fruits, leaves, and stem skin | Infusion, Marinated | Oral | Diarrhea, Diabetes, Vomit |
| Urticaceae<br>*Urtica diocia* L.<br>HJ-149 | Gazaneh | Shoot, roots, seeds | Decoction, Infusion, vapors | Oral | kidney stones, Febrifuge, hypoglycemic, blood pressure |
| Violaceae<br>*Viola odorata* L.<br>HJ-148 | Banafsheh | Flowers, leaves, roots and seeds | Infusion | Oral, Inhalation | Insomnia, cough, asthma and bronchitis |
| Zygophyllaceae<br>*Peganum harmala* L.<br>HJ-140 | Espand | Flowers, Seeds, Stems, Leaves | Leaves and Fruits are crushed | Inhalation | Hypnotics |

**Table 3.** Species ranking based on each index.

| Scientific name | Family name | RFC ranking | CI ranking |
|---|---|---|---|
| *Gallium verum* | Rubiaceae | 1 | 1 |
| *Thymus kotschyanus* | Lamiaceae | 1 | 2 |
| *Achillea wilhelmsii* C. Koch | Asteraceae | 1 | 3 |
| *Ziziphora sp.* | Lamiaceae | 1 | 4 |
| *Mespilus germanica* L. | Rosaceae | 1 | 4 |
| *Achillea biebersteinii* | Asteraceae | 1 | 4 |
| *Achillea millefolium* | Asteraceae | 1 | 5 |
| *Allium Akaka* | Amaryllidaceae | 1 | 5 |
| *Apium graveolens* | Apiaceae | 1 | 5 |
| *Dianthus orientalis* | Caryophyllaceae | 1 | 6 |
| *Echium amoenum* Fisch. & Mey. | Boraginaceae | 1 | 6 |
| *Eryngium caucasicum* Trautv | Apiaceae | 1 | 6 |
| *Hypericum perforatum* | Guttiferae | 1 | 7 |
| *Lonicera floribunda Boiss et Buhse* | Caprifoliaceae | 1 | 7 |
| *Mentha longifolia* | Lamiaceae | 1 | 8 |
| *Nepeta cataria* | Lamiaceae | 1 | 9 |
| *Traxacum vulgare* (Lam.) Scrk | Asteraceae | 1 | 10 |
| *Anthemis persica* | Asteraceae | 2 | 10 |
| *Berberis integerima* | Berberidaceae | 2 | 11 |

| | | | |
|---|---|---|---|
| *Cornus australis* | Cornaceae | 2 | 12 |
| *Cydonia Ablonga Mill.* | Rosaceae | 2 | 13 |
| *Ferula persica* | Apiaceae | 2 | 13 |
| *Fragria vesca* | Rosaceae | 2 | 13 |
| *Heracleum persicum* Desf. | Apiaceae | 2 | 13 |
| *Juglans redia* L. | Juglandaceae | 2 | 14 |
| *Juniperus communis* | Cupressaceae | 2 | 15 |
| *Mentha persica* Benth. | Lamiaceae | 2 | 16 |
| *Nepeta pungens* (Bunge.) Benth | Lamiaceae | 2 | 17 |
| *Plantago lanceolate* | Plantaginaceae | 2 | 18 |
| *Polygonum sp.* | Polygonaceae | 2 | 19 |
| *Stachys laxa* | Lamiaceae | 2 | 19 |
| *Teucrium polium* | Lamiaceae | 2 | 19 |
| *Urtica diocia* | Urticaceae | 2 | 20 |
| *Allium paradoxum* | Amaryllidaceae | 3 | 20 |
| *Allium sativum* | Amaryllidaceae | 3 | 20 |
| *Berberis vulgaris* | Berberidaceae | 3 | 21 |
| *Crataegus microphylla* c. Koch | Rosaceae | 3 | 21 |
| *Juniperus Sabina* | Cupressaceae | 3 | 22 |
| *Lamium album* (Lam) | Lamiaceae | 3 | 23 |
| *Malva neglecta* | Malvaceae | 3 | 23 |
| *Origanum vulgare* | Lamiaceae | 3 | 24 |
| *Peganum harmala* | Zygophyllaceae | 3 | 25 |
| *Stachys lavandulaefolia* | Lamiaceae | 3 | 26 |
| *Cichorium intybus* L. | Asteraceae | 4 | 27 |
| *Calamintha grandiflora* | Lamiaceae | 4 | 27 |
| *Descurainia Sophia* (L,) Schur | Brassicaceae | 4 | 27 |
| *Marrubium vulgare* | Lamiaceae | 4 | 27 |
| *Melica persica Kunth.* | Poaceae | 4 | 27 |
| *Salvia sclarea* L. | Lamiaceae | 4 | 27 |
| *Tanacetum parthenium* | Asteraceae | 4 | 27 |
| *Teucrium chamaedrys* L | Lamiaceae | 4 | 27 |
| *Viola odorata* | Violaceae | 4 | 27 |
| *Artemisia vulgaris* | Asteraceae | 5 | 27 |
| *Artemisia annua* L, | Asteraceae | 5 | 27 |

**Table 2.** IAR values of category of ailments.

| No | Ailments | IAR |
|---|---|---|
| 1 | Endocrine, nutritional and metabolic diseases | 0.50 |
| 2 | Diabetes | 0.73 |
| 3 | Urinary disease | 0.62 |
| 4 | Respiratory disease | 0.60 |
| 5 | Cardiovascular disease | 0.66 |
| 6 | Cold | 0.62 |
| 7 | Nervous disease | 0.80 |
| 8 | Gastrointestinal disease | 0.62 |

### *3.1. Utilization method*

The preparation methods are presented in Fig. 3. There are many approaches in the use of medicinal plants, based on the type of plant and the type of pains; most common preparations were decoction, eaten raw and infusion.

Local people were recorded to make medicinal preparations by using wild plants for curative purposes via simple methods. The most frequently reported mode is infusion (52%) followed by decoction and eaten raw (13%). Dry mode (6%) is in fourth place and people use it in cold seasons. Naghibi *et al.*, (2014) indicated that decoction is the most common utilization methods in Hamedan. Mosaddegh *et al.*, (2016) reported that infusion and decoction are the most method of preparation in Alvand and Tuyserkan.

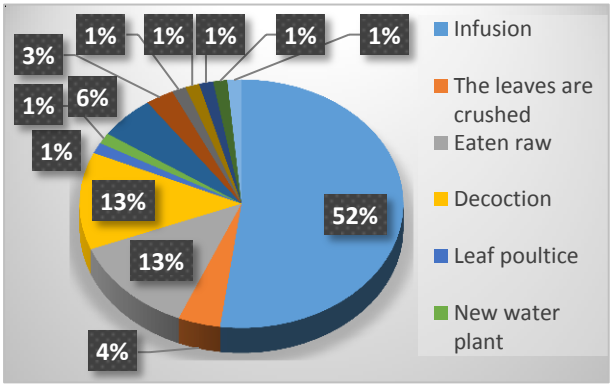


**Fig. 3.** Percentage of preparation methods.

### *3.2. Plant parts used as medicine*

Informants were recorded to use the aerial parts, branches, bulb, inflorescence, flowers, fruits, gum, latex, resin, leaves, roots, seeds, bud, bark, flowering branches, twigs and woods of plants. Results showed that the most common parts of plants are their leaves (34%) (Fig. 4), and this is admitted by many ethnobotanical studies conducted elsewhere in Iran showed the dominance of leaves in the preparation of medicine.

Ghorbani *et al.*, (2005) conducted a study in Turkman sahra region, Iran, say leaves are dominant. The reasons is that because of their easily accessible, contain more easily extractable phytochemicals. Naghibi *et al.*, (2014) conducted similar study like our survey and their result showed that leaves are used more than other parts and their reason was accumulation of tannins and alkaloids in leaves. Hosseini *et al.*, (2009) showed leaves are used more than other parts.

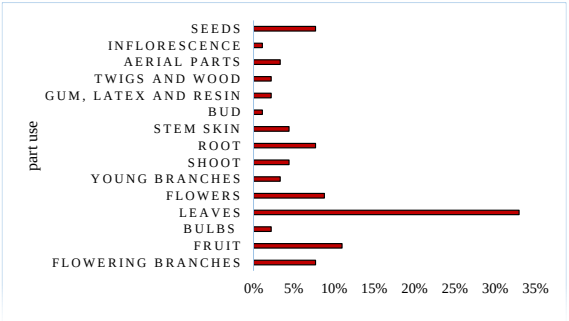


**Fig. 4.** Parts of the plants that commonly used (%).

The ailments of headache, stomachache upset, stress pressure, diarrhea, diabetes and cough are treated by using these plants (Table 1). Almost all of the species have more than one pharmaceutical properties.

### *3.3. Some medicinal plants and literature review*

In the present study, *Urtica dioica* was mentioned to be used in treatment of kidney stones, fever-lowering, hypoglycemic, blood pressure. Other studies mention different diseases that treat by *Urtica dioica* such as analgesic and antimicrobial and anti-hyperglycemic activity (Bnouham *et al.*, 2003; Gülçin *et al.*, 2004), bronchitis, cardiovascular disease, cough, diabetes, respiratory disease and tonsillitis (Hayta *et al.*, 2014).

*Teucrium polium* is traditionally used in Hezar Jerib area to Antiseptic, analgesic and inflammation. There are many other uses for this species, antipyretic and intestinal motility activities (Autore *et al.*, 1984; Yaniv *et al.*, 1987; Gharaibeh *et al.*, 1988; Suleiman *et al.*, 1988; Hayta *et al.*, 2014).

There are many studies in other countries which they results are the same as the result of current study: *Achillea wilhelmsii* (Antihypertensive and hypolipidemic) (Asgary *et al*., 2000), *Allium sativum* (antibacterial activity) (Sokmen *et al*., 1999), *Artemisia vulgaris* (hepatoprotective activity (Gilani *et al*., 2005), *Malva neglecta* (Antioxidant activity and anti-ulcer genic activity) (Gürbüz *et al*., 2005; Dalar *et al*., 2012), *Plantago lanceolate* (antioxidant activity) (Dalar *et al*., 2012).

### *3.4. IAR, RFC, CI calculations*

Diseases that can be treated by plants sorted into 8 groups. The IAR values are presented in the Table2. It is clear that the ICF values range between 0.50 and 0.80. Nervous disease has the highest IAR value with the rate of 0.80. Diabetes and cardiovascular disease had rather high IAR value as 0.73 and 0.66, respectively, while cold, urinary disease and gastrointestinal disease had the same amount of IAR value as 0.62. Endocrine, nutritional and metabolic diseases were lowest IAR value as 0.50.

In some ethnobotanical survey, similar to this study, reported of ethnobotanical study in Kohghiluyeh and Boyer Ahmad Province in Iran, IAR of respiratory disease is 0.032 (Mosaddegh *et al.*, 2012) but in this study is 0.60 and its mean that the more frequent usage of herbal remedies by local people for Respiratory disease compared to other use categories.

Juárez-Vázquez *et al.*, (2013) result showed that diseases of the respiratory system had the highest 0.92 IAR but does not match with our study.

### *3.5. RFC and CI value*

These indices will help better understanding of the traditional knowledge of plants used by local people in one area. As shown in Table 3, 32% (about 17 species) of the species studied have relative frequency of citation one (RFC = 1). It means these species are more popular plants in area. *Artemisia annua* and *Artemisia vulgaris* have the lowest number of citations and thus a few number of informants believed that these are useful species (Table 3).

A comparison between the RFC and the CI indices is shown in table 3. *Gallium verum* is placed in the first position by RFC and CI indices. Also, because of the highest values of CI index, this species has the most diverse uses. *Thymus kotschyanus* and *Achillea wilhelmsii* which were ranked first by RFC index, were ranked second and third by CI index, respectively. Based on Heinrich's view, the culturally important plants are those that are used by a large number of people for the same category of use (Heinrich *et al*., 1998).

## 4. Conclusion

Most commonly used plants are *Gallium verum*, *Thymus kotschyanus*, *Achillea wilhelmsii*, *Ziziphora sp*., *Mespilus germanica*, *Urtica diocia* and *Allium Akaka*. Most commonly used parts of the plants were the leaves (34%), fruits (12%) and flowers (9%). These results are similar to Hosseini *et al.*, (2009). They showed that leaves are the most commonly used parts in Golestan province. Differ from those of in Malatya, Turkey, Tetik *et al*, (2013) reported that most commonly used plants are *Anthemis* sp., *Armeniaca vulgaris*, *Crataegus* sp., *Juglans regia*, *Mentha* sp., *Malva neglecta*, *Plantago* sp., *Rosa canina*, *Rubus sanctus* and *Urtica dioica* and most commonly used parts of the plants were the leaves (42%), flowers (29%) and aerial parts (20%). But Naghibi *et al.*, (2012) concluded that aerial part is the used more.

Many plants are used for the treatment of asthma, diabetes, cardiovascular disorders, colds, expectorant, diabetes, gastric diseases, urinary diseases, respiratory, and throat diseases etc. Literature review showed that curative plants of Hezar Jerib are used in different countries in the treatment of similar diseases. Due to weather condition, most of plant became vanish in winter and fall so they have to collect medicinal plants in summer and spring, to use them during the year. Our interviews revealed that in the study area, plants are still commonly used for medicinal purposes by people in their daily lives.

Most of scientists believe that our ancestors used more medicinal plants than now but now days due to

changes in the environment and life conditions and also expansion of modern care system, use of nature to treat diseases lost its position. For example, some youngsters didn't know that how use plants and or even name of indigenous plants.

Like other parts of Iran (Khajoei Nasab *et al*., 2014; Mosaddegh *et al*., 2012 and Gorbani, 2005), women information about medicinal plants are higher than men. In Kerman, Kohghiluyeh va Boyer Ahmad Province and Turkman sahra, the majority of informants were women. Studies regarding the medicinal plant used by current indigenous populations will upgrade traditional medicine and plant uses, as well as the integration of modern and traditional medicine. However, it is necessary to formulate policies for biodiversity conservation, sustainable management and community development.

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