Ethnobotanical study of medicinal plants used in Arjan – Parishan protected area in Fars Province of Iran

Mehdi Dolatkhahi¹*, Ali Dolatkhahi², Javad Bagher Nejad³

¹Department of Biology, Bushehr Branch, Payam Noor University, Bushehr, I. R. Iran
²Department of Horticultural Science, Faculty of Agriculture, Ferdowsi University of Mashhad, Mashhad, I. R. Iran
³Section of Agriculture, Management of Kazeroon Jahad Keshavarzi, Fars province, I. R. Iran

Abstract

Objective: Today, medicinal plants are widely used in remedies for several ailments and improvement of human health because of their pharmaceutical properties. This study aimed to document important useful medicinal plants and their medicinal characteristics for treatment of human ailments in the Arjan – Parishan protected area in Fars province of Iran during 2010-2012.

Materials and Methods: Data were obtained using direct interviews with 80 informants particularly those who were more familiar with the herbs and their medicinal properties. Collected plants were recognized and families, genera, and species determined using indispensable references. In this paper, scientific name, local name, parts used, and ways of application and ailments treated using traditional medicinal plant species have been provided.

Results: We documented 85 plant species belonging to 39 families and 78 genera used for treating ailments. Among which, Asteraceae with 13 species was the most frequently used family and fruits and leaves were the favored parts for local users. Our results indicated that in this area, the highest compliance in the use of plants in treating ailments were related to the intestinal digestive system (40.8%).

Conclusion: The present study is the first contribution to the ethnobotany of this region. Our results showed that some plants are used for medicinal purposes in this region, either for the same or for different purposes. Generally, the results of the present investigation can be used as a basis for selecting useful medicinal plants and also help to preserve precious information that may otherwise be lost to future generations.

Introduction

Nowadays, medicinal plants are extensively utilized in traditional medicine for treating ailments (Davidson-Hunt, 2000). There is an increasing interest in public for consumption of medicinal plants...
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since they are inexpensive and widely available. According to the statics of world health organization, more than 80% of world population particularly in the under-developed countries, provide their primary healthcare necessities from medicinal herbs (WHO, 2007). The history of using medicinal plant to treat diseases goes back to the ancient history. The study of local knowledge about medicinal herbs is becoming increasingly important in defining strategies for conservation and utilization of biological resources (Jeruto et al., 2008). The notable use and commercialization of medicinal plants to alleviate and cure health problems and ailments in all cities of the country, points out the importance of these natural resources in the folk medicine and culture of the Iranian people (Emami et al., 2012). However, most of the useful information is still available for traditional healers and knowledge of healers is either lost or passed to next generation by the word of mouth (Yirga, 2010). In many developing countries, medicinal plants have not been well studied, tested, or documented (Amiri and Joharchi, 2013). Ethnobotany deals with the collection of valuable medicinal plants by a group of people and describes their different uses (Safa et al., 2012). Hence, identification of useful medicinal plants is an excellent policy to understand their properties by indigenous inhabitants. Our surrounding nature is the habitat of many unknown medicinal plants that indigenous people use for treating their ailments. Iran, by having varied climate and geographical regions and also different types of mountains, plains, deserts, hills, river and lakes, and wetlands is considered to be a center for accessing valuable and scare medical species (Ahvazi et al., 2012). The native knowledge of medicinal plants has been put in danger of being lost by assimilating these tribes and loss of traditional community life (Mosaddegh et al., 2012). Therefore, it seems necessary to perform ethnobotanical studies in Iran to record all the knowledge of folk medicine practiced among native people (Naghibi et al., 2005). Arjan – Parishan protected area with two very beautiful wetlands Parishan and Arjan is situated 60 km west of Shiraz in Fars province. This geographic region is one of the most important human migration roads in Iran, showing a great plant biodiversity, so traditional usage of medicinal plant is a familiar therapeutic way for native people. In recent years, traditional use of plants for medical purposes has drawn the attention of researchers in our country as well (Ahvazi et al., 2012; Mirdeilami et al., 2011; Ghorbani, 2005; Mosaddegh et al., 2012; Safa et al., 2012). However, there are no published records on ethnobotanical knowledge of medicinal plants in the area. The main objective of the present study was to elicit data on the traditional uses of medicinal plants in the Arjan- Parishan protected area.

Study area

The Arjan – Parishan protected region (29° 34’ 48” N and 51° 54’ 36” E) covers an area of about 60000 hectares in southwest Iran (Figure 1), receiving an average annual rainfall of about 430 mm. This very beautiful area of attractive landscape such as the Arjan and Parishan wetlands is located between Kazeroon and Shiraz. The vast majority of the residents of this region are ethnic Persians. In this area, agriculture plays the main economic role. People of the Arjan – Parishan region have a long history of utilizing medicinal plants to cure their diseases according to their cultural background. This area is important for plant biodiversity due to the presence of some important habitats such as
international wetland of Parishan and “oak forest” that are dominated by Quercus brantii L. Approximately, 60% of this area is surrounded by Zagros Mountain. International Wetland of Parishan is located 12 km to the southeast of Kazeroon. The climate of this area is arid and cold desert with the average elevation 820 m above sea level. Arjan wetland with altitude of 2015 m above sea level is situated 60 km west of Shiraz in Fars province. This area has semi-arid to semi-humid climate. Due to variation in altitude, topography, and bioclimate within this area, the diversity of medicinal plants and indigenous medical knowledge are rich. Therefore, this biodiversity can be important in aspects of ethnobotanical and pharmaceutical potentials. At present, the Arjan – Parishan area is considered as protected area by IUCN classification.

![Figure 1. Study area: Geographical location of Arjan- Parishan area in Fars Province, Iran.](image)

**Materials and Methods**

In order to gather information on medicinal species found in the Arjan-Parishan protected area, an investigation was performed during 2010-2012. According to the geographical and topographic maps, various parts of the region were referred in proper seasons and then the vernacular information of plants and their usages were collected from well-experienced people and finally all collected plants specimens were dried and pressed. All plant species encountered during field observations were recorded. A questionnaire was administered to the local people, through face-to-face interviews. During the interviews, local names, utilized parts, and preparation methods of the plants as well as information on the types of ailments treated using traditional medicinal plant species were recorded. The informants were selected as they were known as being knowledgeable by the local community. Interviews were done at informants’ homes, farms, or medicinal plant markets, after making clear that they are participating in a research project with the purpose of saving the local traditional knowledge. Collected plants were recognized and their families, genera, and species were determined using of Flora Iranica (Assadi et al., 1989; Awan et al.,
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2011; Parsa and Maleki, 1978; Rechinger, 1987), Flora of Turkey (Davis, 1965-1988), Flora of Syria (Post and Dinsmore, 1932), and Flora of Iraq (Townsend et al., 1966-1985). Identified plants were deposited at the herbarium of Payame Noor university center of Bushehr.

Results

The present ethnobotanical survey gathered information on 85 plant species reported by the informants for their medicinal use (see Tables 1). The species belonged to 78 genera and 39 families. Collected species included two pteridophyta, one gymnosperma, two monocotyledons, and 80 dicotyledones (the largest order in the medicinal flora of area). According to results of this experiment, the largest genera were Anthemis, Artemisia, Capparis, Morus, Rumex, Ziziphus, and Amygdalus (2 species each). The most common application methods were edible (40%) followed by decoction (27%), infusion (17%), poultice (6%), hydrodistillation (4%), drench (4%), and powder (2%) (Figure 2).

| Family          | Scientific name         | Local name | Part used | Local uses                                  | Uses                          | H. No |
|-----------------|-------------------------|------------|-----------|--------------------------------------------|-------------------------------|-------|
| Anacardiaceae   | Pistacia khinjuk Stocks.| Kolkhong   | Fr        | Body reinforcement, Joint and muscles pain | Edible, Poultice              | 522   |
| Apliaceae       | Ammi majus L.           | Khelal     | A, p      | As toothpick                               | Edible                        | 547   |
|                 | Anthemum graveolens L.  | Sheved     | Se, L     | Indigestion in children, Blood Lipid, Joint pain | Edible                       | 591   |
|                 | Coriandrum sativum L.   | Gishniz    | L, Se, St | Reducing blood lipid and sugar, Flatulency, Antiseptic | Edible, Decoction             | 609   |
|                 | Foeniculum vulgare Mill.| Rajuoneh   | Se        | Painful menstruation, Joint pain, Flatulency, Back pain, Nervous weakness | Decoction                     | 565   |
| Araceae         | Oliveria decumbens Vent.| Den        | Fr        | Stomachache, Dyspepsia, Flatulency         | Decoction                     | 624   |
| Asteraceae      | Biarum straussii Engl.  | Kardeh     | L         | Kidney stone, Cholagogue                   | Edible                        | 637   |
|                 | Achillea tenuifolia Lam.| Bimadaroon | Fr        | Blood fat, Flatulency, Abdominal pain       | Infusion                      | 502   |
|                 | Anthemis alissima L.    | Babone     | Fr        | Heart tonic                                | Infusion                      | 538   |
|                 | Anthemis austroiranica  | Baboone    | Fr        | Heart tonic                                | Infusion                      | 615   |
|                 | Rech.f., Aellen & Esfand.| Dermane   | A, p, Fl  | Menstruate pain, Stomachache, Blood fat    | Edible                        | 545   |
|                 | Artemisia dracunculus L.| Tarkhonii  | St, L     | Decrease blood pressure, Appetizing, Spice, Skin diseases | Edible                       | 651   |
|                 | Calendula persica C.A.  | Gole Gorbe | Fl, L     |                                            | Decoction                     | 664   |
|                 | Mey., Centaurea bruguiera(Ly.) Hand.-Mazz.| Bad Bord | Fr | Blood sugar, Diabetes | Infusion | 564 |
|                 | Cichorium intybus L.    | Kashni     | St, L     | Liver tonic                                | Hydridistillation             | 521   |
|                 | Cynara scolymus L.      | Kangar     | L, Rh     | Cooling                                    | Edible                        | 544   |
|                 | Echinops cephalotes DC. | Shekarook  | Re        | Digestive problems, Hoarsening             | Decoction                     | 537   |
|                 | Lactuca serriola L.     | Bikh Bonje | L         |                                            | Edible                        | 671   |
| Berberidaceae   | Matricaria recutita L.  | Baboone Gawy | Fr | Antimicrobial, Hair tonic | Infusion | 511 |
| Boraginaceae    | Silybum marianum (L.) Gaertn. | KharKhanganoo | Se, Fl | Decrease blood pressure | Decoction | 567 |
|                 | Berberis vulgaris L.     | Zereshk    | Fr        | Fever, Liver tonic, Heart tonic             | Edible                        | 641   |
|                 | Anchusa italic Retz.    | Gol GoZaboon | Fr | Treatment of respiratory problems | Infusion | 536 |
|                 | Heliotropium europaeum L. | Oftow Paras | A, p | Scorpions Bite | Decoction | 548 |

Table1. Medicinal plant species collected from Arjan - Parishan protected area and their traditional uses.
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| Family            | Species                    | Part Used | Preparation | Uses                                      | Page |
|-------------------|----------------------------|-----------|-------------|-------------------------------------------|------|
| Brassicaceae      | Capsella bursa-pastoris    | St, Fl    | Infusion    | Astringent, Anti blood pressure, Gastrodina | 593  |
|                   | (L.) Medik.                |           |             | Kidney stone                               | 673  |
|                   | Nasturtium officinale R.   | ST, L     | Decoction   | Depression, Analgesic                      | 543  |
|                   | Br. Symphytum officinale   | ST, Fr, Fl| Decoction   | Flatulence, Diuretic                       | 569  |
| Capparidaceae     | Capparis parviflora       | Kewerak-Lagin | Decoction   | Astringent, Rheumatism                     | 596  |
|                   | Boiss.                     | ST, Fr, Fl| Decoction   | Diuretic, Astringent, Rheumatism, Blood fat and sugar, Hemorrhoids | 519  |
|                   | Capparis spinosa L.        | Kewerak-Lagin | Decoction   |                                          |      |
| Cucurbitaceae     | Citrullus colocynthis     | Khair Gorgoo | Decoction   | Treatment of anemia, Improve memory        | 511  |
| (L.) Schrad.      |                            | Aboo Jal  |             |                                            |      |
| Cuscutaceae       | Cuscuta angulata          | Saratan   | Decoction   | Regulating blood lipid and Sugar, Diabetes, scented | 682  |
|                   | Engelm.                   | Wh. p     |             |                                            |      |
| Ephedraceae       | Ephedra pachyclada        | Hoonder   | Decoction   | Wound washing                             | 642  |
|                   | Boiss.                    | ST, L     |             | Warts                                     | 597  |
| Equisetaceae      | Equisetum arvense         | Dom Asbi  | Decoction   | Astringent, Diarrhea                      | 601  |
|                   | L.                       | Shir Shirook |             | Edible                                   |      |
|                   | Euphorbia helioscopia     | Kerntoo   | Decoction   | Treatment of respiratory problems, Prevention of insects bite | 643  |
|                   | (Burm.) Boiss.            | Se        |             |                                           |      |
|                   | Salvia macrophylon        | Gol Pashe | Decoction   | Treatment of Kidney and bladder infections, Emollient, Prevention of hair loss | 683  |
|                   | Boiss.                    | A. p      |             | Edible                                   |      |
|                   | Teucrium polium L.        | Alpe      | Infusion    | Regulating blood lipid and Sugar, Diabetes, scented | 671  |
|                   |                           | FL, L     |             |                                            |      |
| Malvaceae         | Vitex agnus-castus L.     | Bangroo   | Decoction   | Astringent, Hemorrhoids                   | 675  |
|                   | Alcea Aucheri (Boiss.)    | FL, L, Fr |             | Emollient, Prevention of hair loss        | 685  |
|                   | Alef.                    | FL, Fr    |              |                                            |      |
|                   | Malva parviflora L.       | Toolak    | Infusion    |                                            |      |
|                   |                           | FL, L     |              |                                            |      |
| Moraceae          | Ficus carica L.           | Anjir     | Decoction   | Treatment of Kidney and bladder infections, Emollient, Prevention of hair loss | 683  |
|                   | Morus alba L.             | Tite Safid| Decoction   |                                            |      |
|                   | Morus nigra L.            | Tite Siah | Decoction   |                                            |      |
| Myrtaceae         | Myrrhis communis L.       | Mound     | Decoction   |                                            |      |
| Olearacea         | Olea europea L.           | Zeytoon   | Decoction   |                                            |      |
| Papilionaceae     | Albagi camelorum         | Khar Shotor | Infusion    |                                            |      |
|                   | Fisch.                    | Meik      |             |                                            |      |
|                   | Glycyrrhiza glabra L.     | Mahak     | Infusion    |                                            |      |
|                   | All.                      | Shabdar   |             |                                            |      |
| Plantaginaceae    | Prospis farcta (Banks & Sol.) J.F. Macbr. | Kharag Sag | Decoction   |                                            |      |
|                   | Trifolium repens L.       | Shabdar   | Decoction   |                                            |      |
|                   | Plantago major L.         | Barhang   | Decoction   |                                            |      |
| Poaceae           | Phragmites australis (Cav) Trin.ext.Steud | Ney | Decoction   |                                            |      |
|                   |                           | L, Fl     |             |                                            |      |
| Podophyllaceae    | Leonite leontopetalum L.  | Tegh Tegh Konak | Decoction   |                                            | 574  |
| Polygonaceae      | Rumex dentatus L.         | Torshook  | Infusion    |                                            |      |
|                   | Rumex vesicarius L.       | Torshook  |             |                                            |      |
| Portulacaceae     | Portulaca oleracea L.     | Ghorfe    | Decoction   |                                            |      |
| Primulaceae       | Anagalis arvensis L.      | Anaghalis | Decoction   |                                            |      |
| Pteridaceae       | Adiantum Capillus-Veneris L. | Parsiavashoo | Infusion   |                                            | 510  |
| Puniceae          | Punica granatum L.        | Anar      | Decoction   |                                            | 505  |

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| Family     | Genus                      | Species Name | Part Used | Preparation | Treatment                  | Use          |
|------------|----------------------------|--------------|-----------|-------------|----------------------------|--------------|
| Ranunculaceae | Adonis dentata          | Delile        | L., Fl   | Decoction   | Rheumatism                 | Decoction 579|
| Rhamnaceae  | Ziziphus nummularia     | (Burn. f.) Wight & Arn. | Lamrik   | Decoction   | Appetizing, Cholagogue     | Decoction 586|
|            | Ziziphus spinosa-christi | (L.) Willd.  | Konar     | Powder, Edible | Washing hair, Cold         |              |
| Rosaceae    | Amygdalus communis L.   |              | Badoum   | Infusion    | Skin diseases, Treatment of asthma | Infusion 540|
|            | Amygdalus glauca        | Browicz.     | Akhorak   | Infusion    | Skin diseases, Treatment of asthma | Infusion 516|
|            | Crataegus aronia (L.)   | Bosc. ex Dc. | Kial     | Edible      | Insomnia- migraine          | Edible 680   |
|            | Malus communis Desf.    |              | Sib-E Kohi | Edible      | Cholagogue, Vitam, Tonic    | Edible 530   |
|            | Pyrus communis L.       |              | Anchochak | Edible      | Kidney stone                | Edible 580   |
|            | Rubus sanctus Schreb.   |              | Tit Are   | Edible      | Diuretic, Appetizing, Expectorant | Edible 584   |
| Salicaceae  | Salix alba L.           |              | Bidmeshk  | Hydrodistilation | Rheumatism                 | Hydrodistilation 608|
| Solanaceae  | Datura stramonium L.    |              | Tatureh   | Gout, Burning wounds | Anti- asthma, Sedative     | 556          |
|            | Hyoscyamus tenuicaulis  | Schönb.-Tem. | Bang Done | Anti- asthma, Sedative     | 682          |
|            | Solanum nigrum L.       |              | Rob Torwak | Edible      | Emollient, Reducing blood lipid and glucose, Bronchitis, Pectoraliga | Decoction 648|
| Urticaceae  | Urtica pilulifera L.    |              | Gazane    | Decoction   | Rheumatism, Rash            | Decoction 506|
| Verbenaceae | Verbena officinalis L.  |              | Shapasand | Decoction   | Blood purifier, Fever       | Decoction 527|
| Vitaceae    | Vitis vinifera L.       |              | Angour    | Edible      | Appetizing, Contain a variety of vitamins | Edible 553   |
| Zygophylaceae | Peganum harmala L.     |              | Dounesht  | Decoction   | Rheumatism, Antiseptic,     | Decoction 524|
|            | Tribulus terrestris L.  |              | Khar Polangi | Infusion   | Expectorant                 |              |

However, some plants were used in more than one method of preparation. Different parts of medicinal plants (roots, leaves, fruits and seeds, intact plant, etc.) were used by the local inhabitants as medicines (23). Fruits and leaves each with (25%) followed by seeds (14%), flowers (13%), stem (8%), aerial parts (5%), whole plant (3%), latex (2%), root (2%), rhizome (1%), receptacle, (1%) and bark (1%) were among the most widely used medicinal parts (Figure 3). In this paper, we also mentioned the list of most efficient medicinal plants of the Arjan - Parishan protected area for treating ailments (Table 2). As shown in Figure 4, Asteraceae with 13 species followed by Lamiaceae with seven species, Rosaceae with six species and Apiaceae, Brassicaceae, and Papilionaceae families each with five species were the most frequent families in the area.

Figure 2. Mode of preparations and their percentages.

Figure 3. Plant parts used in treating ailments and their percentage.
The results obtained from the present study indicated that medicinal plants of the Arjan – Parishan protected area are used in the treatment of many diseases particularly for intestinal-digestive disorders (40.8%), bone and joints pain (15.6%), kidney and urogenital diseases (14.4%), blood sugar and lipid (14.4%), common cold, expectorant, and fever (10.8%), appetizing (10.8%), heart-blood circulatory system disorders (9.6%), respiratory disorders (7.2%), antiseptic (4.8%), skin and hair (4.8%), menstruate (4.8%), insect bite (3.6%), and sedative (2.4%) (Figure 5).

**Discussion**

During recent decades, chemical side effects have been identified and actions have been taken to overcome this problem (Mozaffari Nejad et al., 2013). Hence, even in the modern age, in developed countries, people still rely on traditional system of healthcare not only because of its low price, but also due to low side effects as compared to modern allopathic medicine (Awan et al., 2011). It is believed that rational use of native medicinal plants along with effective synthetic drugs may benefit and improve the quality of life and living standards of the native inhabitants (Namsa et al., 2011; Oliveira et al., 2011). Despite the importance of these plants for health improvement, it seems that some of the most promising medicinal plants have not yet been fully identified. For this reason, documentation of the indigenous knowledge through ethno-botanical studies is important for the conservation and utilization of biological resources (Muthu et al., 2006). Because of seasonal, soil, climatic, and topography variation, Iran is rich in plant biodiversity and especially medicinal plants.
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Table 2. The most efficient medicinal plants of Arjan – Parishan protected area for treating ailments.

| Category                          | Plants                                                                 |
|----------------------------------|------------------------------------------------------------------------|
| Digestive                        | Foeniculum vulgare, Oliveria decumbens, Biarum straussii, Achillea tenuifolia, Artemisia annua, Artemisia dracunculus, Cichorium intybus, Echinops cephalotes, Lactuca serriola, Berberis vulgaris, Capsella bursa-pastoris, Cardaria draba, Descurania Sophia, Capparis parviflora, Capparis spinosa, Citrullus colocynthis, Ricinus communis, Quercus brantii, Mentha longifolia, Vitex agnus-castus, Alcea aucheri, Malva parviflora, Ficus carica, Morus alba, Morus nigra, Olea europaea, Glycerhiza glabra, Plantago major, Rumex dentatus, Rumex vesicarius, Punica granatum, Crataegus aronia, Rubus sanctus, Datura stramonium, Solanum nigrum, Vitis vinifera |
| Kidney and Urinary system        | Adiantum capillus-veneris, Biarum straussii, Nasturtium officinale, Capparis parviflora, Capparis spinosa, Malva parviflora, Alhagi camelorum, Portulaca oleracea, Anagalis arvensis, Rubus sanctus, Hyoscyamus tenuicaulis, Tribulus terrestris |
| Heart and blood vessels          | Anthemis altissima, Anthemis austro-iranica, Artemisia dracunculus, Silybum marianum, Berberis vulgaris, Capsella bursa-pastoris, Juglans regia, Melilotus indicus, Prospis farcta, Portulaca oleracea, Verbena officinalis |
| Skin and Hair                    | Calendula perversa, Matricaria recutita, Euphorbia helioscopia, Alcea aucheri, Ficus carica, Morus alba, Ziziphus nummularia, Ziziphus spina-christi, Amygdalus communis, Amygdalus glauca, Urtica pilulifera |
| Respiratory                      | Anchusa italica, Equisetum arvense, Salvia macrosiphon, Glycerhiza glabra, Plantago major, Amygdalus communis, Amygdalus glauca, Datura stramonium, Hyoscyamus tenuicaulis, Solanum nigrum |
| Common Cold, Antipyretic And Expectorant | Adiantum capillus-veneris L., Berberis vulgaris, Ocimum basilicum, Trifolium repens, Plantago major, Anagalis arvensis, Rubus sanctus, Verbena officinalis, Peganum harmala |
| Blood Sugar                      | Centaurea bruguierana, Capparis spinosa, Citrullus colocynthis, Otosegia persica, Teucrum polium, Solanum nigrum |
| Blood Lipid                      | Anethum graveolens, Achillea tenuifolia, Artemisia annua, Tencrium polium, Portulaca oleracea, Solanum nigrum |
| Rheumatism                       | Capparis parviflora, Capparis spinosa, Adonis dentate, Salix alba, Urtica pilulifera, Peganum harmala |
| Depression and Nerve system relaxant | Cuscuta kurdica, Melissa officinalis, Crataegus aronia, Salix alba, Hyoscyamus tenuicaulis |
| Mouth and Tooth                  | Anmi majus, Matricaria recutita, Ephedra pachyclada, Juglans regia, Oicinum basilicum |
| Antiseptic                       | Centaurea bruguierana, Matricaria recutita, Descurania Sophia, Peganum harmala |
| Bone, Joints and Muscle          | Pistacia khinjuk, Capparris spinosa, Myrtus communis, Glycerhiza glabra |
| Reconstituent and Vitminae        | Pistacia khinjuk, Sissybrium loeseli, Capparris spinosa |
| Menstruate                       | Anthemis altissima, Anthemis austro-iranica, Trifolium repens |
| Insects Bite                     | Heliotropium europaeum, Salvia macrosiphon |

The Arjan – Parishan protected area comprise great biodiversity of plant species bearing variation of climatic and also different ecological habitats such as mountains, hills, plains, valleys, and lakes. It appears that there are many medicinal uses for the treatment of different diseases in the study area which were rarely revealed before this. According to the current study, Asteraceae and Lamiaceae were the dominant locally used families (Figure 4). Our results are also in agreement with ethnobotanical studies performed in other parts of Iran such as Hormozgan province (Safa et al., 2012), Kohgiluyeh va Boyer Ahmad province (Mosaddegh et al., 2012), and Maraveh Tappe region, north of Iran (Mirdeilami et al., 2011). It may be due to adaptation of these families with arid and semiarid conditions. Moreover, from the large genera found in this area, Ziziphus and Amygdalus can be referred which provide suitable habitat for other medicinal plants because of the vicinity to the Zagros mountain range. From the 85 species reported in this paper, some of the plants are being used more frequently and also are
well-known compared to others which may be due to their availability and knowledge of the local people. Among them, Adiantum capillus-veneris L., Oliveria decumbens, Achillea tenuifolia, Anthemis altissima, Anthemis austro-iranica, Cynara scolymus, Berberis vulgaris, Nasturtium officinale, Capparis spinosa, Citrullus colocynthis, Quercus brantii, Melissa officinalis, Ocimum basilicum, Teucrium polium, Malva parviflora, Ficus carica, Olea europaea, Alhagi camelorum, Plantago major, and Portulaca oleracea can be named. Some of medicinal plants in this region belong to different species of a genus, but their species are all known to one local name. The best examples are Anthemis austro-iranica, Anthemis altissima, Rumex dentatus, Rumex vesicarius, Capparis spinosa, and Capparis parviflora. Some other medicinal plants in this region have vast distribution such as Pistacia khinjuk, Achillea tenuifolia, Capparis spinosa, Euphorbia helioscopia, Mentha longifolia, and Olea europaea. Among these medicinal plants, some are located in impossible places such as Pistacia khinjuk, Crataegus aronia, Malus communis, Pyrus communis, therefore, they are used mostly by native people who have easier access to them. In addition, some plants have both medicinal and edible uses and increasingly entered the market in specific seasons, such as Cynara scolymus, Berberis vulgaris, Juglans regia, Ficus carica, Olea europaea, Vitis vinifera, Crataegus aronia, Punica granatum, and Ocimum basilicum. It seems that there are many medicinal uses for the treatment of several ailments and illnesses in the studied area. Traditional understanding of phytotherapy of this district provides excellent outcome in treating different types of ailments such as intestinal-digestive disorders, followed by bone and joint pain, kidney and urogenital diseases, blood sugar and lipid, common cold, expectorant and fever, appetizing, heart-blood circulatory system disorders, respiratory disorders, antiseptic, skin and hair, menstruate, insect bite, as well as as a sedative. The high use of medicinal plants by the native inhabitants to cure intestinal-digestive ailments could be attributed to the high preponderance of these disorders in the area. It appears that the gastrointestinal system is the most common use in studies in different districts of Iran (Mosaddegh et al., 2012; Miraldi et al., 2001). The most frequently used parts by local people were leaves and fruits. Our data are in agreement with the recent results of Rajaee and Mohamadi (2012). They reported that the leaves are the dominant part used. As shown in Table 2, in order to relieve pain, people use some plants that are mentioned more frequently by the informants for the same use compared to other plants such as Glycyrrhiza glabra L., Pistacia khinjuk, Capparis spinosa, and Myrtus communis. Considering the extreme importance of plants of the area in treating gastrointestinal ailments, it is recommended to conduct further studies to identify the active ingredients of these herbs.

In this research paper, efforts have been made to document the traditional knowledge of important medicinal plants of the Arjan – Parishan protected area. The presence of 85 medicinal plants indicates high biodiversity of medicinal plant in the region. These plants are abundantly found in this region and are considered to be used for treatment of various diseases. It is concluded that the Arjan – Parishan protected area has good ethnobotanical potentials for medicinal plants and all of the plants found in this study are most favorite among the local people. According to the results of this research, fruits and leaves are the major used parts in this region. It is important to emphasize that intestinal-digestive system is the first target for traditional medicine in the area. Therefore, the information documented on the medicinal plants of the Arjan – Parishan protected area may serve as baseline data.
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for future pharmacological and phytochemical studies and consequently discover new drugs.

Conflict of interest
We certify that there is no conflict of interest with any financial organization regarding the manuscript.

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