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# ETHNOBOTANICAL STUDY OF MEDICINAL PLANTS USED BY KURD TRIBE IN DEHLORAN AND ABDANAN DISTRICTS, ILAM PROVINCE, IRAN

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## Abstract

This paper provides significant ethnobotanical information on pharmaceutical plant uses, where some degree of acculturation exists, so that there is urgency in recording such data. The aim of this work is to catalogue, document, and make known the uses of plants for folk medicine in Dehloran and Abdanan districts, Ilam Province, Iran. An analysis was made of the species used, parts of the plant employed, preparation methods, administration means, and the ailments treated in relation to pathological groups. A folk botanical survey was carried out from February 2007 to October 2009. The information was collected from 81 persons (60% men and 40% women) in 20 villages. The informants reported data on 122 species, belonging to 49 botanical families, were claimed as medicinal. This work is focused on human medicinal plant uses, which represent 95% of the pharmaceutical uses. The most commonly represented families were Asteraceae (37.5%), Lamiaceae (20.8%), Rosaceae (18.7%), Fabaceae (16.7%) and Apiaceae (14.6%). Some of the uses were found to be new when compared with published literature on ethnomedicine of Iran. The folk knowledge about medicinal plant use is still alive in the studied region, and a number of scarcely reported plant uses has been detected, some of them with promising phytotherapeutical applications. The results of the study reveal that some of species play an important role in primary healthcare system of these tribal communities.

**Key words:** Medicinal plants, ethnobotany, folklore plant, Ilam

## Introduction

The Ilam province is situated on the west of Iran. This province known as “Thyme land or locally as Sarzamin-e-Avishan” and it is principally a mountainous region with plains following the direction of West Zagros range. It borders Khuzestan province in the south, Lurestan province in the east, Kermanshah province in the north and Iraq in the west with 425 kms of common border (Figure 1). Ilam is located between latitude 31º 58´ to 34º 15´ N and longitude 45º 24´ to 48º 10´ E. It occupies an area of 19,086 km². The elevation range is between 50 m above sea level in the south to 3060 m above sea level in the west province (Kabirkooh Mountain).

The climate of the region is influenced with its varied elevation. Annually, it generally rains 200 mm in the south and 500 mm in the north and the period of winter, the minimum temperature can reach -15ºC in north and summer is day with maximum temperature between 45ºC in south. Humidity is generally high especially in the winter (Dec-Mar) months (Ilam Meteorology Office, 2010).

The natural vegetation is rangeland and oak forest. Flora of Ilam province is extremely rich with about 1000 species of plant (Mozaffarian, 2008). The present study focused on the current status of knowledge of folk medicine in Abdanan and Dehloran districts. These districts are situated on the west and southwest of Ilam province. The Ilam population is predominantly Feyli Kurdish. The province total population was 545,787 in 2006. The population of Abdanan and Dehloran was 47,370 and 62,256 in 2006, respectively. The northern part of the province is mostly inhabited by Kurdish tribes who speak with two dialects: Kalhuri and Feyli. The majority are Feyli Kurds, such as Kurdish tribes of Khezel, Arkawâzi, Beyrey (Ali Sherwan), Malekshahi and Shuhan. Lurs live in the southern and eastern parts of the province; for example: Abdanan, Dareh Shahr, Dehloran and Mehran. Most are Shi'a Muslims. The Kurds are traditionally nomadic people. The people's main source of living in this region is farming, agriculture, sheepherding and husbandry (MPOI, 2003).

Plants have always had an important role to play in medicine and public health. The knowledge on the use of medicinal plants was acquired by trial and error and handed on from generation to generation (Ghorbani, 2005). Nevertheless, handing down of this knowledge is in danger due to bad contacts between older and younger generations. Iran has a long medical tradition and traditional learning of medicinal plants (Ghorbani, 2005). Some authors have investigated the traditional pharmacopeia and medicinal plants in different areas of Iran (Afshar, 1990; Amin, 1991; Ayiineh Chii, 1989; Ghasemi Pirbalouti, 2009; Ghorbani, 2005; Hovayzeh et al., 2001; Miraldi et al., 2001; Mir-Heidari, 1993; Salehi Surmaghi et al., 1992; Zargari, 1989–1992). However, no information is available on the medicinal plants of the Ilam communities. In order to record all these medicinal knowledge, new or rare uses of medicinal plants and to record any use of plants in the region, the ethnobotanical survey of Ilam communities is undertaken.

The aims of this paper are:

- The documentation of indigenous medicinal plants used in Ilam, Iran

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- The assessment of uses of the native species
- The description of the most common preparations made from herbal drugs used in Ilam ethnomedicine.

## Materials and Methods

### Plant material

This study investigated plant material used for medicinal purposes within communities located in the Dehloran and Abdanan district, Ilam province, and involved 122 plant species. The plant specimens were collected either in the flowering or the fruiting condition, preferably both. A specimen of each species with a size of about 30 cm was collected. Each specimen was numbered as and when it was collected and the detailed notes were entered in the field note book. All the collected specimens were properly processed. Provisional identifications of specimens were made with the help of "Flora of Iran" (Ghahreman, 1987-1989), "Flora of Ilam" (Mozaffarian, 2008), "Encyclopedia of Iranian Plants" (Mozaffarian, 1996), Flora Iranica" (Rechinger, 1963-1998), etc. Later identifications were confirmed with the help of the authentic specimens deposited at the Herbarium of Researches Centre of Agriculture and Natural Resources of Ilam, Iran.

### Experimental

An ethnobotanical survey of Abdanan and Dehloran districts, Ilam province, was conducted during February 2007 to October, 2009. The data of native medicinal plants were collected from 81 individuals comprised of herbal practitioners, young and elders (60% men and 40% women) in 20 villages, mostly of the southern and western parts of the area. The informants were between the age of 22 to 65 years. The information was collected through questionnaire, interviews and discussions among the tribal practitioners in their local language (Kurdish). A semi-structured questionnaire was used to extract information on types of ailments treated by the use of medicinal plants and plant parts used in treating the respective ailments (Appendix 1).

### Data analyses

The data collected during the fieldwork have been entered and analyzed in a database generated with Microsoft Excel 2007 (Microsoft Corporation) software**.** The results have been structured in a plant catalogue that considers the following items: plants mentioned (including scientific, English, Persian and local names); botanical families which these plants belong to; medicinal, edible and non edible uses separated by the part of the plant employed, and also other utilizations that can have ethnobotanical interest. Pharmaceutical methods of preparing the remedies are also part of the catalogue, as well as if the plant referred can be part of a mixture. Comparisons between the plants claimed as useful by our informants and those previously reported have been carried out consulting other previous works on ethnobotany, economic botany, medicinal plants and phytotherapy. It has been considered as very scarcely reported those not found in these papers, or appearing only in a maximum of three of them. This method has allowed us to determine the degree of originality and novelty of the uses claimed by the informants.

## Results

### Medicinal plants reported

The present study revealed that a total of 122 plants belonging to 106 genera and 49 families have been documented for their therapeutic use against different diseases (Table 1 and Figure 1). Most of the medicinal plants are collected from wild (~93%) and only nine species (7%) are cultivated in an area, either in gardens or fields (*Trifolium repens*, *Sesamum indicum*, *Nicotiana tabacum*, *Salix alba*, *Rosa damascena*, *Pimpinella anisum*, *Medicago sativa*, *Cannabis sativa* and *Crocus sativus*). Among them 84 were herbs (68%), 21 were shrubs (17%) and 18 were trees (15%) (Figure 2). The most commonly represented families were Asteraceae (37.5%), Lamiaceae (22.92%), Rosaceae (18.75%), Fabaceae (16.67%) and Apiaceae (14.58%), Brassicaceae (10.42%) and Chenopodiaceae (8.33%) (Figure 1). The most abundant genus was *Centaurea*, three species; *Allium*, *Amygdalus*, *Artemisia*, *Astragalus*, *Cerasus*, *Crocus*, *Ferula*, *Pisachia*, *Rosa*, *Scrophularia*, *Salvia*, *Xanthium* and *Ziziphus* had two species (Table 1).

### Plant parts used, preparation and administration

Leaves (30%) are the most widely used plant parts even solely or mixed with other parts, followed by flowers (22%), fruits (13%) and stem (10%) in some cases the whole plant (Figure 3).

**Table 1:** Medicinal plants used by Kurdish community in Dehloran and Abdanan districts, Elam province, Iran

| Row | Scientific Name | Family name | Elam Kurdish name | Persian name | English name | Habit | Life cycle | Parts used | Way of application | Uses/Ailments treated |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | *Achillea biebersteinii* Afan. | Asteraceae | Boomaro, Berenj daz, Gol Zard | Boomadaran-e-Zard | Yarrow | H | Perennial | Flowers, Leaves | External/ Internal | Indigestion, rheumatism, sedative (toothache), anti-septic and hemagglutinate |
| 2 | *Adianthum capillus-veneris* L. | Polypodiaceae | Kamar Avizeh, Bareh za | Parsiavoushan | Southern maidenhair, Venus's hair | H | Perennial | Flowers, Leaves | Internal | Anti-septic, kidney pain, anti-calculus, analgesia and hair color |
| 3 | *Adonis dentate* Delile. | Ranunculaceae | Gol Zarde | Cheshme Khorous, Gol Khorousak | Adonis, bird's eye | H | Annual | Flower | Internal | digestive discords and indigestion, Joundice |
| 4 | *Alhagi persarum* Boiss. & Buhse. | Fabaceae | Agoul, Aghol | Kharshootor, Toranjabin | Camel's thorn | H | Perennial | Stems, Leaves | Internal | Anti-calculus, anti-septic, kidney problems, urine tube infection and laxative (for baby) |
| 5 | *Allium akaka* Gmelin. | Aliaceae or Liliaceae | Aneshk, Anesh, Valk | Valk | Ramsons broad, bear's garlic | H | Perennial | Leaves, Bulbs | Internal | Appetizer, anti-septic, anti-calculus, anti-parasite and good digestive system |
| 6 | *Allium ampeloprasum* L. subsp. *iranicum* Wendelbo | Aliaceae or Liliaceae | Tareg | Tareh Koohi, Piaz Kalagh | Perennial sweet leek, great round-headed garlic | H | Perennial | Leaves, Bulbs | Internal | Anti-septic, kidney infection, urine infection, anti-calculus, gastric pain, intestinal problem and culinary |
| 7 | *Alcea angulata* (Freyn & Sint) Freyn & Sint. Ex Iljin | Malvaceae | Gole hirou | Khatmi | Mallow | H | Perennial | Roots | External/ Internal | Burn, cut wound and emollient |
| 8 | *Alyssum minus* (L.) Rothm. | Brassicaceae | Ghedameh | Ghodomeh | Alyssum | H | Annual | Fruits | Internal | Emollient, cough, sore throat and eyes discords |
| 9 | *Amygdalus arabica* Olivier. | Rosaceae | Bayem, Vayem | Badam-e-Koohi | Almond | T | Perennial | Fruits | Internal/ External | Child ear pain, body pain (for animal) and analgesic, bronchitis, anti-calculus and digestive discords |
| 10 | *Amygdalus lycioides* Spach. | Rosaceae | Taneges | Tangras | Almond | T | Perennial | Fruits | External | Good hair condition |
| 11 | *Rhamnus pallasii* Fisch. & C. A. Mey | Rhamnaceae | Arjan | Siah tangress | Buckthorn | S | Perennial | Fruits | Internal | Cold, emollient, cough and sore throat |
| 12 | *Anthemis altissima* L. | Asteraceae | Babineh | Babooneh | Chamomile | H | Annual | Flower | External/ Internal | Indigestion and skin whiting |
| 13 | *Aristolochia olivieri* Collegno in Boiss. | Aristolochiaceae | Zaravand | Chopoghak | Dutchman's-pipe | H | Perennial | Leaves, Stem | External | Dermal discords and wound |

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| 14 | *Calendula persica* C. A. Mey. | Asteraceae | Golzardeh | Hamisheh Bahar-e-Irani | Iranian marigold | H | Annual | Flower | External | Dermal discords, wound and eczema |
| 15 | *Artemisia sieberi* Besser. | Asteraceae | Bookhoshkeleh | Dermaneh-e-Zagrosi | Wormwood | H | Annual | Stems, Leaves | Internal | Anti-parasite, anti-diarrheal and stomachic |
| 16 | *Artemisia scoparia* Waldst. & Kit. | Asteraceae | Salmaneh | Jaroy-e-Mashhadi | Oriental worm wood | H | Annual/ biennial | Inflorescence | Internal | Indigestion, emollient and sore throat |
| 17 | *Astaragalus glaucacanthus* Fisch. | Fabaceae | Miveh badkonaki | Asbi gavan | Astragal | S | Perennial | Fruits | Internal | Used in food and confectionery, tonic, gastric pain, headache and wild fruit |
| 18 | *Astragalus gossypinus* Fisch. | Fabaceae | Gavan | Gavan-e-panbehi | Astragal | S | Perennial | Resin | External/ Internal | Good hair condition and cold |
| 19 | *Cotoneaster* lurestanica Klotz. | Rosaceae | Shir khesht | Shirkhesht-e-lorestani | Cotoneaster | S | Perennial | Resin | Internal | Laxative for baby |
| 20 | *Atriplex leucoclada* (Boiss.) Aellen. | Chenopodiaceae | Ramt | Salmaki saghe safid | Saltbush | H | Perennial | Leaves | Internal | Emollient, cough and sore throat |
| 21 | *Avena wiestii* Steud. | Poaceae | Ganem giah | Youlaf | Wild oat | H | Annual | Seed | Internal | Gastric pain, indigestion, rheumatism and tonic |
| 22 | *Cannabis sativa* L**.** | Canabinaceae | Shadone | Shahdoneh | Hemp | H | Annual | Fruits | Internal | Seed use for nut, laxative, anti-parasite, tonic, cough and nerve system discords |
| 23 | *Capparis spinosa* L. | Capparidaceae | Kelkam, Shafileh, Shafalk | Kavar | Caper | H/S | Perennial | Leaves, Roots, Bark and Fruits | Internal | Root bark: hepato-protective, Stem bark: toothache, Leaves and Fruits: Regulation of blood sugar |
| 24 | *Cardaria draba* (L.) Desv. | Brassicaceae | Tof veh sereh | Ozmak | Hoary cress | H | Perennial | Young leaves | Internal | Culinary and tonic |
| 25 | *Carthamus oxyacantha* M.B. | Asteraceae | Khar kharon, Zardeh siri, Zardeh drag | Golerang-e-zard | Safflower | H | Annual | Flowers | Internal | For women period discords and menorrhagia |
| 26 | *Centaurea iberica* Trev. Ex Spreng. | Asteraceae | Asan darag | Gole Gandom-e-chaman zar | Centaurea | H | Annual | Flowers | Internal | Gastric pain |
| 27 | *Centaurea intricate* Boiss. | Asteraceae | Benjek dargi | Gole Gandom-e-darham barham | Centaurea | H | Perennial | Flowers | Internal | Indigestion and gastric pain |
| 28 | *Centaurea ovina* Pall. Ex Willd. | Asteraceae | Tilage | Gole Gandom | Centaurea | H | Annual | Flowers | Internal | Indigestion and gastric pain |
| 29 | *Cerasus mahaleb* (L.) Miller. | Rosaceae | Beralik, Heloneh, Mahloo | Mahlab | Mahaleb cherry | T | Perennial | Fruits | Internal | Laxative, anti-calculus, culinary and spice and wild fruit: stomachic |
| 30 | *Cerasus microcarpa* (C.A. | Rosaceae | Beralik, Helaneh | Albaloy-e- | Sour cherry | T | Perennial | Bark, Resin | Internal | Sedative, anti-calculus |

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| | Mey) Boiss. subsp. *microcarpa* | | | vahshi | | | | | | and anti-fever |
| 31 | *Cichorium intybus* L. | Asteraceae | Kasni | Kasni | Chicory | H | Perennial | Root, Stem, Leaves | Internal/ External | Laxative, diuretic, gastric pain and dermal discords |
| 32 | *Cirsium congestum* Fisch. & C. A. mey. Ex DC. | Asteraceae | Kangar darag | Kagar-e-anboh | Bull thistle | H | Biannual | Stem | Internal | Anti-septic for gastric |
| 33 | *Citrullus colocynthis* (L.) Schrad. | Cucurbitaceae | Shoomi sheytoneh, Shomi tilaneh | Hanzal, Hendevaneh Abougahl | Citrul/Citrule | H | Perennial | Fruits | External/ Internal | Diabetes and wound |
| 34 | *Colchicum kotschyi* Boiss. | Iridaceae | Kirgeh keh ran | Gol-e-hasrat | Autumn saffron | H | Perennial | Flowers | External | Rheumatism |
| 35 | *Crataegus pontica* C. Koch. | Rosaceae | Gich | Zalzalak | Azarole | T | Perennial | Fruits, Leaves | Internal | Edible as wild fruit, heart tonic, antihypertensive and headache |
| 36 | *Crocus haussknechtii* Boiss. | Iridaceae | Pishog | Joo ghasem | Crocus | H | Perennial | Flowers | Internal | Anti-septic for gastric and stomachic |
| 37 | *Crocus sativus* L. | Iridaceae | Kal mas | Zaferan | Saffron | H | Perennial | Stigma, Style | Internal | Breezy, tonic for heart and culinary use |
| 38 | *Daphne mucronata* Royle. | Thymelaeaceae | Toye, alef | Khoshak | Daphne | S | Perennial | Wood | External | Cleaning eyes and eye pain (Surmeh) |
| 39 | *Datura innoxia* Miller. | Solanaceae | Tatureh | Datureh-e-goldorosht | Hindu datura | H | Annual | Latex | External | Anti-wart |
| 40 | *Consolida orientalis* (Gey) Schrood. | Ranunculaceae | Zaban ghafa | Zaban pas ghafa-e-denae | Larkspur | H | Annual | Flowers | Internal | Laxative and anti-parasite |
| 41 | *Dianthus orientalis* Adam. | Caryophylaceae | Gole Mikhak | Mikhak | Pink | H | Perennial | Flowers, Fruits | External/ Internal | Toothache and anti-spasm |
| 42 | *Echinops viscidulus* Mozaff. | Asteraceae | Ghane shakrook | Shekar Tighal | Globe thistle | H | Perennial | Bulb | Internal | Cough, cold, sore throat and edible as vegetable |
| 43 | *Echium italicum* L. | Boraginaceae | Gole gazou | Gavzaban | Viper's bugloss | H | Biannual | Flower | Internal | Nervous system relaxant, carminative, cold, sore throat, wound and soporific |
| 44 | *Elaeagnus angustifolia* L. | Elaeagnaceae | Ardegon | Sanjed, Pestanak | Oleaster | T | Perennial | Fruits | Internal | Anti-diarrheal, gastric pain and hepatoprotective |
| 45 | *Ephedra ciliata* Fisch. ex C. A. Mey | Ephedraceae | Rish boz, Kori feri | Ormak, rish boz | Joint fir | S | Perennial | Root, Stem | Internal | Anti-bacterial and anti-fever |
| 46 | *Euphorbia macroclada* Boiss. | Ephurbiaceae | Shirghoteghan | Farfiun | Milkwort | H | Perennial | Latex | External | Anti-wart |
| 47 | *Ferula haussknechtii* Wolff ex Rech. f. | Apiaceae | Komeh, Komieh | Koma | Giant fennel | H | Perennial | Stem, Leaves, Inflorescence | External | Anti-septic (smoking) |

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| 48 | *Ferula behboudiana* (Rech. f. & Esfand) Chamberlain. | Apiaceae | Anio | Koma-e-lorestani | Giant fennel | H | Perennial | Stem, Leaves, Inflorescence | External | Anti-septic (smoking) |
| 49 | *Ferulago angulata* (Schlecht.) Boiss. | Apiaceae | Chavir | Chavil-e-shevidi | Ferulago | H | Perennial | Leaves | Internal | Anti-septic, spice and air fresher |
| 50 | *Ficus carica* L. | Moraceae | Anjir | Anjir | Fig | T | Perennial | Fruits, Latex | Internal/ External | Laxative, cough and anti-wart |
| 51 | *Fritillaria imperialis* L. | Liliaceae | Sosan gol | Ashke maryam, Laleh vajhgon | Crown imperial | H | Perennial | Bulb | External | Rheumatism and sciatica |
| 52 | *Fumaria parviflora* Lam. | Fumariaceae | Shatareh | Shahtareh-e-irani | Fumitory | H | Annual | Flowers, Stem, Leaves | External | Dermal discords, wound and eczema |
| 53 | *Glycyrrhiza glabra* L. var. *glabra* | Fabaceae | Balik | Shirin bayan | Licorice | H | Perennial | Roots, Flowers | Internal | Gastric ulcer, digestive discords, duodenal pain, stomach stranger, diabetes, intestinal pain and culinary |
| 54 | *Gundelia tournefortii* L. | Asteraceae | Kenyer | Kangar | - | H | Perennial | Leaves, Stem | Internal | Edible as vegetable, indigestion, tonic, laxative, anti-calculus, diabetes and culinary |
| 55 | *Hypericum scabrum* L. | Hypericaceae | Siveh ran | Gol-e-raye | St. John's wort | H | Perennial | Inflorescence | Internal | Green tea, sedative, headache and nerve system relaxant |
| 56 | *Isatis raphanifolia* Boiss**.** | Brassicaceae | Vasmeh | Vasmeh | Dyer's woad | H | Annual | Root, Leaves, Seed | External | Coloring for hair |
| 57 | *Lonicera nummulariifolia* Jaub. & Spach. | Caprifoliaceae | Pela khor, Shan | Pelakhor | Lonicera | S | Perennial | Leaves, Flowers | Internal | Anti-fever, anti-diarrheal, sedative and cough |
| 58 | *Lycium depressum* Stocks. | Solanaceae | Khoshk | Gorg tigh | Wolf berry | S | Perennial | Leaves, Fruits | Internal/ External | Kidney problems |
| 59 | *Malva neglecta* Wallr. | Malvaceae | Toli, Tole | Panirak | Mallow | H | Annual, biennial | Leaves, Flowers | Internal | Interstitial infection, laxative, sore throat and asthma |
| 60 | *Medicago sativa* L. | Fabaceae | Vinjeh | Younjeh | alfalfa | H | Perennial | Leaves, Flowers | Internal | Tonic and fattening |
| 61 | *Mentha longifolia* (L.) Hudson. | Lamiaceae | Pineh | Pooneh, Podneh | Horsemint | H | Perennial | Leaves, Flowers | Internal | Carminative, edible as vegetable and flavoring |
| 62 | *Myrtus communis* L. | Myrtaceae | Moort | Mord | Myrtle | T | Perennial | Leaves | External/ Internal | Anti-septic (smoking), women diseases, wound (antimicrobial) and air freshener |

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| 63 | *Narcissus tazetta* L. | Amaryllidaceae | Gole Narges | Narges | Polyanthus narcissus | H | Perennial | Flowers and Bulb | Internal/ External | Flowers: Aromatic or aromatherapy (sedative, headache and cold), anti-parasite and abortion |
| 64 | *Nasturtium officinal*e (L.) R. Br. | Brassicaceae | Koleh shak, Balmak | Alaf-e-cheshmeh | Water cress | H | Perennial | Leaves, Flowers, Roots | Internal | Stomachic, anti-parasite |
| 65 | *Nepeta persica* Boiss. | Lamiaceae | Poneh say | Poneh say-e-Irani | Catmint | H | Perennial | Leaves,Flowers | Internal/ External | Carminative and anti-urticarial |
| 66 | *Nerium oleander* L. | Apocynaceae | Hortil, Jeleh, Gharjalak | Kharzahreh, Kish | Oleander | S | Perennial | Leaves, Flowers, Latex | External/ Internal | External: Burn, wound healing and eczema, Internal: diuretic and heart tonic |
| 67 | *Nicotiana tabacum* L. | Solanaceae | Tanbakoo | Toton | Tobacco | H | Annual | Leaves | External | Anti-leech (*Limnatis nilotica*), anti-*dermatophytosis* and used veterinary (health animal) |
| 68 | *Noaea mucronata* (Forssk.) Asch &Schweinf. | Chenopodiaceae | Khargo | Nakhon-e-aroos | - | S | Perennial | Leaves, Flowers | Internal | Anti-calculus |
| 69 | *Onobrychis elymaitica* Boiss. & Hausskn. ex Boiss. | Fabaceae | Pieh kol | Speres-e-elami | Sainfoin | H | Perennial | Leaves, Flowers | Internal | Anti-calculus, kidney problems |
| 70 | *Opoponex hispidus* (Friv.) Griseb. | Apiaceae | Alaf shir | Koma | Opopnax | H | Annual | Stem, Leaves, Inflorescence | External | Anti-septic (smoking) |
| 71 | *Paliurus spina-christi* Miller. | Rhamnaceae | Dereg dar | Siyah telo | Christ's thorn | S | Perennial | Fruits | Internal | Anti-hypertensive and reduced cholesterol |
| 72 | *Papaver dubium* L. | Papaveraceae | Gole soreh | Khashkash-e-tannaz | Great scarlet poppy | H | Annual | Leaves, Flowers | Internal | Nerve system relaxant, sedative |
| 73 | *Peganum harmala* L. | Zygophyllaceae | Span | Spand, Sphand | Harmel peganum | H | Perennial | Fruits, Seeds | External | Anti-septic for air, scorpion bite, snake bite, toothache and soporific |
| 74 | *Periploca aphylla* Decne. | Asclepiadaceae | Kholf | Gishder | Silk vine | S | Perennial | Leaves, Flowers | External | Anti-inflammatory |
| 75 | *Phlomis olivieri* Benth. | Lamiaceae | Labeh goshak, Giveh balkeh | Goshbareh, Bareh Gosh, Chalmah | Phlomis | H | Perennial | Leaves, Flowers | Internal | Carminative |
| 76 | *Physalis divaricata* D. Don. | Solanaceae | Arosak postheh pardeh | Arosak postheh pardeh | Winter cherry | H | Annual | Fruits | Internal | Kidney discords |
| 77 | *Picnomon acarna* (L.) Cass. | Asteraceae | Gemal diom | Zard khar | Yellow plume thistle | H | Annual | Leaves | Internal | Indigestion, gastric discords and stomachic |

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| 78 | *Pimpinella anisum* L. | Apiaceae | Vaveh shing | Badian romi | Anise | H | Annual | Fruits | Internal | Carminative and culinary use |
| 79 | *Pistachia atlantica* Desf. | Anacardiacea | Banak, Kalang Kaleh, Kaleh van | Pesteh Koohi/Baneh | Pistache | T | Perennial | Fruits, Resin | Internal | Mind stranger, anti-hemorrhoid, laxative, stomach stranger and bone pain |
| 80 | *Pistachia khinjuk* Stocks. | Anacardiacea | Koleng Narmeh, Narmeh van | Khenjuk | Pistache | T | Perennial | Fruits, Resin | Internal | Digestive discords, diuretic, asthma, stomach stranger and fragrant mouth |
| 81 | *Portulaca oleracea* L. | Portulacaceae | Perpelik, Denan tizkarak | Khorfeh | Purslane | H | Annual | Roots, Stem, Leaves, Latex | Internal | Edible as vegetable, anti-parasite |
| 82 | *Prangos ferulacea* (L.) Lindl. | Apiaceae | Bale har, Ginoo | Jooshir | Prangos | H | Perennial | Leaves, Flowers | External/ Internal | Laxative |
| 83 | *Prosopis farcta* (Banks & Soland) Macbr. | Mimosaceae | Belaveri, Broweri, Khosh khah shak | Kahoorak | Syrian mesquite | S | Perennial | Fruits | Internal | Blood thinner and anti-diabetic (Reduction of blood glucose) |
| 84 | *Quercus brantii* Lindl. var *persica* (Jaub. & Spach) Zohary | Fagaceae | Bali, Bero | Baloot | Oak | T | Perennial | Fruits, Seed bark | Internal | Gastric ulcer, stringent, sore throat and anti-diabetes |
| 85 | *Rheum ribes* L. | Polygonaceae | Ribas | Rivas | Rhubarb | H | Perennial | Stem | Internal | Edible as vegetable, anti-hypertensive and decrease triglyceride |
| 86 | *Rhus coriaria* L. | Anacardiaceae | Sumakh | Sumagh | Sicilian sumac | S | Perennial | Fruits | Internal | Stomachic, anti-diarrheal, tonic, digestive discords and culinary use |
| 87 | *Rosa canina* L. | Rosaceae | Goltieureg | Nastaran-e-vahshi | Dog rose | S | Perennial | Flowers | Internal | Indigestion |
| 88 | *Rosa damascena* Mill. | Rosaceae | Gol bakhi | Gol-e-mohammadi | Persian rose | S | Perennial | Flowers | Internal | Indigestion |
| 89 | *Rubus anatolicus* (Focke.) Focke ex Hausskn. | Rosaceae | Tiyarak | Tameshk barg narvani | Elm-leaved blackberry | S | Perennial | Fruits | Internal | Stomachic, anti-parasite |
| 90 | *Rumex ephedroides* Bornm. | Polygonaceae | Torsheh mast | Torshak-e-rishbozi | Dock | H | Annual | Leaves | External | Anti-inflammatory |
| 91 | *Salix alba* L. | Salicaceae | Vi, Bi | Bid-e-sephid | White willow | T | Perennial | Bark, Leaves | Internal/ External | Anti-fever |
| 92 | *Salsola vermiculata* L. | Chenopodiaceae | Shoor | Alaf shoor-e-sharghi | Saltwort, R | S | Perennial | Stem, Leaves | Internal | Laxative, anti-ascorbic |
| 93 | *Salvia palaestina* Benth. | Lamiaceae | Cherogi | Maryam goli falestini | Annual clary | H | Annual | Leaves, Inflorescence | Internal | Women fertility and women infections |
| 94 | *Scrophularia deserti* Del. | Scrophulariaceae | Benjek mashin, | Gol-e-maymoni | Figwort | H | Perennial | Stem, Leaves | External | Wound and burn healing and antimicrobial |
| 95 | *Salvia sclarea* L. | Lamiaceae | Maryam goli | Maryam goli | Clary | H | Perennial | Leaves, Seed, Inflorescence | Internal | Cold and anti-fever |
| 96 | *Satureja khuzistanica* | Lamiaceae | Jatareh | Marzeh | Summer | H | Annual | Leaves, Stem, | Internal | Indigestion, headache, gastric pain, |

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|---|---|---|---|---|---|---|---|---|---|---|
| | Jamzad. | | | | savory | | | Flowers | | women infections, diuretic and spice |
| 97 | *Scrophularia striata* Boiss. | Scrophulariaceae | Teshneh dari | Gol-e-maymoni | Figwort | H | Perennial | Stem, Leaves | External | Wound and burn healing and antimicrobial |
| 98 | *Seidlitzia rosmarinus* (Ehrh.) Bge. | Chenopodiaceae | Benjak shenan, Hejhedan | Eshnan | Seidlitzia | S | Perennial | Leaves | External | Used as washing, good hair condition and plant shampoo |
| 99 | *Sesamum indicum* L. | Pedaliaceae | Konjed | Konjed | Sesame | H | Annual | Seed | External | Burn healing |
| 100 | *Sinapis arvensis* L. | Brassicaceae | Khartal, Terpeki | Khardal-e-zagrosi | Mustard | H | Annual | Stem, Flowers | Internal | Laxative and stomachic |
| 101 | *Smyrnium cordifolium* Boiss. | Apaiacea | Pinomeh, Vangi | Avandol | Alexanders | H | Biannual | Stem | Internal | Indigestion and stomachic |
| 102 | *Solanum nigrum* L. | Solanaceae | Roarazak, tamato kivi leh | Sag angor, Tajrizi-e-siyah | Black nightshade | H | Annual | Fruits | External | Skin diseases, wound healing and eczema |
| 103 | *Sorghum halepense* (L.) Pers. | Poaceae | Helit | Ghiagh, Chaeer | Johnson grass | H | Perennial | Leaves, Stem, Flowers | Internal | Abortion for human and animals |
| 104 | *Stachys lavandulifolia* Vahl. | Lamiaceae | Colpar | Sonbolehei | Stachys | H | Perennial | Leaves, Flowers | Internal | Carminative, rheumatism, indigestion, headache, sedative, cardio tonic and anti-anxiety |
| 105 | *Stipa capensis* Thunb. | Poaceae | Gol koo, Bahmah giah | Chaman sozani | Needle grass | H | Annual | Flowers | Internal | Nerve system problems and gastric discords |
| 106 | *Tamarix ramosissima* Ledeb. saltcedar | Tamaricaceae | Shoor gaz | Gaz-e-shahi | Tamarisk | T | Perennial | Leaves and Resin | Internal/ External | Dermal discords, wound healing and sputum |
| 107 | *Tanacetum polycephalum* Schultz. | Asteraceae | Samsa | Minay-e-porkopeh | Tansy | H | Perennial | Leaves | External | Anti-hemorrhoid, anti-inflammatory and sting |
| 108 | *Teucrium polium* L. | Lamiaceae | Miyere nekhe | Maryam nokhodi | Germander | H | Perennial | Leaves, Flowers | Internal | Anti-septic for gastric and fragrant mouth |
| 109 | *Thymbra spicata* L. | Lamiaceae | Azboh, Hazboh | Avishan-e-zophaye | Thyme | H | Perennial | Leaves and Inflorescence | Internal | Spice, cough, antibacterial and carminative |
| 110 | *Tragopogon graminifolius* DC. | Asteraceae | Haplook | Shang | Salsify | H | Annual | Root, Flowers | Internal/ External | Emollient, sore throat and wound healing |
| 111 | *Trifolium repens* L. | Fabaceae | She pareh | Shabdar-e-sephid | White clover | H | Biannual | Leaves and Inflorescence | Internal/ External | Analgesia and dermal discords |
| 112 | *Typha domingensis* Pers. | Typhaceae | Lovan | Loei | Cat's tail | H | Perennial | Pollen, Rhizome | Internal | Anti-fever |
| 113 | *Ulmus glabra* Hudson. | Ulmaceae | Vazam | Narvan-e-barg riz | Elm | T | Perennial | Leaves | Internal | Heart discords and fertility discords |
| 114 | *Verbascum alepense* Benth. | Scrophulariaceae | Gol zardeh | Gol-e-mahour | Mullein | H | Perennial | Leaves and Flowers | Internal/ External | Anti-fever, dermal discords and wound healing |
| 115 | *Vicia angustifolia* L. | Fabaceae | Masheh maran | Mashak-e-barg | Narbonne | H | Annual | Fruits | Internal | Cough |

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| | | | | pahn | vetch | | | | | |
| 116 | *Viscum album* L. | Loranthaceae | Darpechanak | Darvash | White mistletoe | T | Perennial | Leaves, Stem, Flowers | External/ Internal | Body pain, knew joint pain and abscess |
| 117 | *Vitex pseudo-negundo* (Hausskn.) Hand-mzt. | Verbenaceae | Keref, Kerof | Bangaro | Chaste tree | S | Perennial | Leaves | Internal | Increased milk |
| 118 | *Xanthium spinosum* L. | Asteraceae | Chazanak | Zardineh | Cocklebur | H | Annual | Leaves and Fruits | External | Dermal discords, diuretic |
| 119 | *Xanthium strumarium* L. | Asteraceae | Chazanak | Zardineh | Cocklebur | H | Annual | Leaves and Fruits | Internal | Laxative, stomach, tonic |
| 120 | *Ziziphora capitata* L. | Lamiaceae | Kakooti | Moshk taramoshk | Ziziphora | H | Annual | Leaves and Inflorescence | Internal | Spice and culinary |
| 121 | *Ziziphus nummularia* (Burm. F.) Wighth & Arn. | Ramnaceae | Darak, Konar | Ramlik | Camel thorn | T | Perennial | Leaves and Fruits | External | Gastric pain and stomachic |
| 122 | *Ziziphus spina-christi* (L.) Willd. | Rhamnaceae | Sedr, Azakonar | Konar | Christ's thorn | T | Perennial | Leaves and Fruits | External | Anti-dandruff and anti-hair loss |

Habit: T: Tree, S: Shrub, H: Herb

**Table 2:** Major ailments treated by the local inhabitants of the Dehloran and Abdanan regions, Ilam Province, Iran using medicinal plants species

| S. no. | Ailments | No. of plants | Percentage |
|---|---|---|---|
| 1 | Gastric pain | 17 | 5.69 |
| 2 | Anti-septic | 14 | 4.68 |
| 3 | Indigestion | 14 | 4.68 |
| 4 | Laxative | 14 | 4.68 |
| 5 | Wound Healing | 14 | 4.68 |
| 6 | Anti-calculus | 10 | 3.34 |
| 7 | Stomachic | 10 | 3.34 |
| 8 | Cough | 9 | 3.01 |
| 9 | Sore throat | 9 | 3.01 |
| 10 | Anti-parasite | 8 | 2.68 |
| 11 | Dermal discords | 8 | 2.68 |
| 12 | Tonic | 8 | 2.68 |
| 13 | Anti-fever | 7 | 2.34 |
| 14 | Carminative | 7 | 2.34 |
| 15 | Cold | 6 | 2.01 |
| 16 | Digestive | 6 | 2.01 |
| 17 | Emollient | 6 | 2.01 |
| 18 | Headache | 6 | 2.01 |
| 19 | Kidney pain | 6 | 2.01 |

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|---|---|---|---|
| 20 | Regulation Blood sugar | 6 | 2.01 |
| 21 | Sedative | 6 | 2.01 |
| 22 | Burn healing | 5 | 1.67 |
| 23 | Diuretic | 5 | 1.67 |
| 24 | Hair treatment | 5 | 1.67 |
| 25 | Rheumatism | 5 | 1.67 |
| 26 | Anti-diarrheal | 4 | 1.34 |
| 27 | Anti-Inflammatory | 4 | 1.34 |
| 28 | Eczema | 4 | 1.34 |
| 29 | Heart tonic | 4 | 1.34 |
| 30 | Nerve System Discords | 4 | 1.34 |
| 31 | Toothache | 4 | 1.34 |
| 32 | Anti-microbial | 3 | 1.00 |
| 33 | Anti-wart | 3 | 1.00 |
| 34 | Stomach stranger | 3 | 1.00 |
| 35 | Ethno-Veterinary | 3 | 1.00 |
| 36 | Abortion | 2 | 0.67 |
| 37 | Analgesia | 2 | 0.67 |
| 38 | Anti-hemorrhoid | 2 | 0.67 |
| 39 | Anti-hypertensive | 2 | 0.67 |
| 40 | Body pain | 2 | 0.67 |
| 41 | Fragrant mouth | 2 | 0.67 |
| 42 | Soporific | 2 | 0.67 |

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|---|---|---|---|
| 43 | Women infections | 2 | 0.67 |
| 44 | Abscess | 1 | 0.33 |
| 45 | Anti-anxiety | 1 | 0.33 |
| 46 | Anti-ascorbic | 1 | 0.33 |
| 47 | Anti-bacterial | 1 | 0.33 |
| 48 | Anti-dandruff | 1 | 0.33 |
| 49 | Anti-hair loss | 1 | 0.33 |
| 50 | Anti-leech | 1 | 0.33 |
| 51 | Anti-Tumor | 1 | 0.33 |
| 52 | Anti-urticarial | 1 | 0.33 |
| 53 | Appetizer | 1 | 0.33 |
| 54 | Blood thinner | 1 | 0.33 |
| 55 | Bone pain | 1 | 0.33 |
| 56 | Bronchits | 1 | 0.33 |
| 57 | Child ear pain | 1 | 0.33 |
| 58 | Decrease triglyceride | 1 | 0.33 |
| 59 | Duodenal pain | 1 | 0.33 |
| 60 | Eyes discords | 1 | 0.33 |
| 61 | Fattening | 1 | 0.33 |
| 62 | Fertility discords | 1 | 0.33 |
| 63 | Heart discords | 1 | 0.33 |
| 64 | Hemagglutinate | 1 | 0.33 |
| 65 | Hepatoprotective | 1 | 0.33 |

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|---|---|---|---|
| 66 | Increased milk | 1 | 0.33 |
| 67 | Intestinal Problem | 1 | 0.33 |
| 68 | Joundice | 1 | 0.33 |
| 69 | Knew joint pain | 1 | 0.33 |
| 70 | Menorrhagia | 1 | 0.33 |
| 71 | Mind stranger | 1 | 0.33 |
| 72 | sputum | 1 | 0.33 |
| 73 | Reduced Cholesterol | 1 | 0.33 |
| 74 | Sciatica | 1 | 0.33 |
| 75 | Scorpion bite | 1 | 0.33 |
| 76 | Snake bit | 1 | 0.33 |
| 77 | Sting | 1 | 0.33 |
| 78 | Urine Tube | 1 | 0.33 |
| 79 | Women Period disords | 1 | 0.33 |

**Culinary and spice uses**

At present, 14 plants are collected in the study area for their use in culinary, spice and food. Among them, 10 species are reported also for therapeutic use (see Table 1); 3 are used only as food. The villagers employ *Crocus sativus*, *Cerasus mahaleb*, *Ferulago angulata*, *Mentha longifolia*, *Pimpinella anisum*, *Satureja khuzistanica*, *Thymbra spicata*, *Ziziphora capitata* and *Rhus coriaria* as flavoring agents. The leaves and stem of *Mentha longifolia*, *Portulaca oleracea*, *Rheum ribes*, *Allium ampeloprasum* subsp. *iranicum* and bulbs of *Echinops viscidulus* are used as wild vegetables. The fruits of *Crataegus azarolus*, *Cerasus mahaleb*, *Ficus carica*, *Pistachia atlantica*, *Pistachia khinjuk*, *Prosopis farcta*, *Rubus anatolicus*, *Ziziphus nummularia*, *Ziziphus spina-christi*, *Amygdalus arabica*, *Amygdalus lycioides* and *Elaeagnus angustifolia* are used as wild fruit. *Astaragalus glaucacanthus* are used as culinary and confectionery, tonic, gastric pain, headache and or as wild fruit. They boil tender leaves of *Cardaria draba* to prepare soups and *Gundelia tournefortii* to prepare pickled.

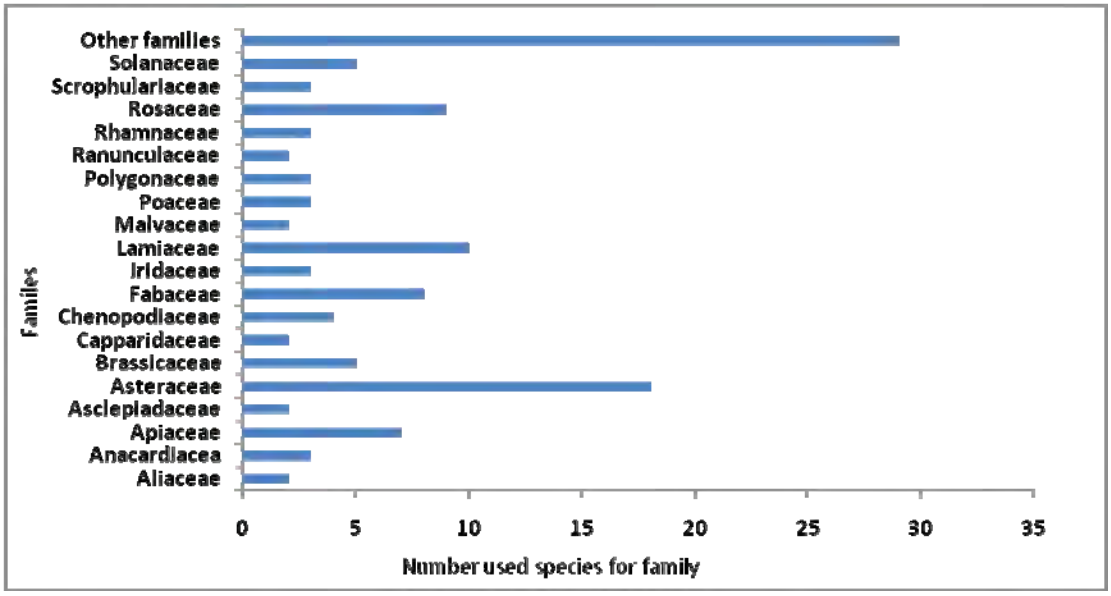


**Figure 1:** Frequency of plant families used in Dehloran and Abdanan district, Ilam province, Iran

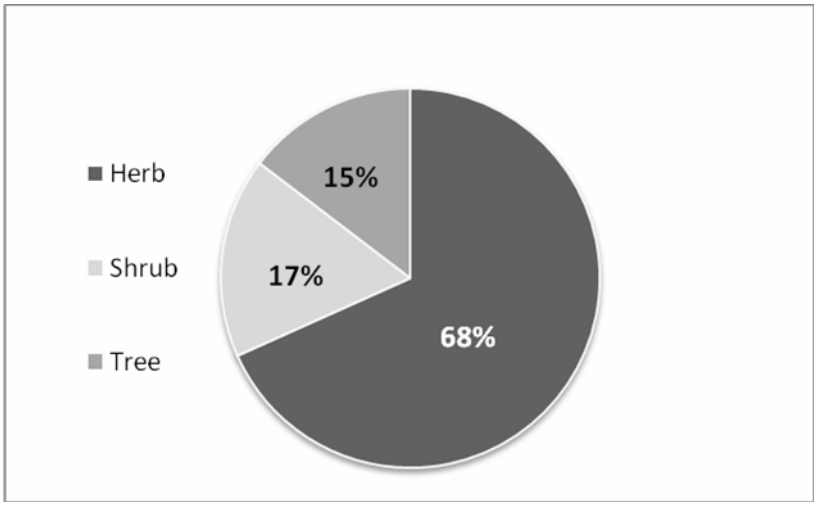


**Figure 2:** Frequency of habit plants used in Dehloran and Abdanan district, Ilam province, Iran

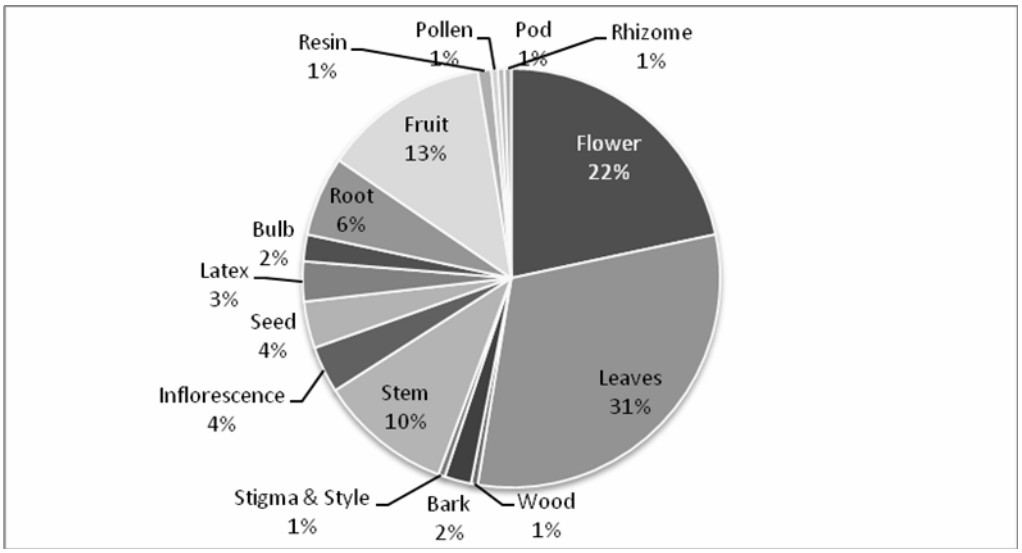


**Figure 3:** Frequency of plant parts used in Dehloran and Abdanan district, Ilam province, Iran

**Ailments treated**

The 122 medicinal plant species were used in treating 79 different types of ailments (Table 2). The highest number of plant species (17 species) was used for the treatment of gastric disorders followed by antiseptic, indigestion, laxative and wound healing (14 species).

**Veterinary uses**

Interviewees have mentioned few species for treatment of animals. *Nicotina tabacum* (reported by the 10% of informants) is only used in veterinary medicine, as anti-parasitic (Anti-leech for example: *Limnatis nilotica*) and antifungal (anti-*dermatophytosis*) for external use. *Sorghum halepense* and *Amygdalus arabica*, used commonly for humans (see Table 1), are employed as remedies for domestic animals. The leaf and stem of *Sorghum halepense* is administered externally to animals for abortion. The oil seed of *Amygdalus arabica* is used externally for body pain.

**Marketability of medicinal plants**

*Nicotiana tabacum* used as a stimulant (smoking), *Cannabis sativa is* used as a nut, while *Sesamum indicum* is used as a culinary agent and nut (oil crop) and *Crocus sativus* is used as a spice and culinary (color and flavor of rice and other foods) medicinal plants were sold in the market for their respective indications.

## Discussions and conclusions

In present study, we have compared our ethnobotanical data with the data present in Iranian Medicinal plant literatures (Afshar, 1990; Amin, 1991; Ayiineh Chii, 1989; Ghasemi Pirbalouti, 2009a,b; Ghorbani, 2005; Hovayzeh et al., 2001; Miraldi et al., 2001; Mir-Heidari, 1993; Rojhan, 1991; Salehi Surmaghi et al., 1992; Zargari, 1989–1992). Most of the plants indicated by the interviewees are reported in Iranian literature, but not in every occasion were the actions attributed to a plant the same. For example, there are not reports in the official Iranian phytotherapy of the use of *Atriplex leucoclada* and *Echinops viscidulus* as an emollient, cough and sore throat; *Avena wiestii* as treatment of gastric pain and rheumatism; *Centaurea iberica*, *Centaurea ovina*, *Centaurea intricate* and *Picnomon acarna* as treatment of gastric pain; *Cerasus microcarpa* subsp. *microcarpa* as sedative, anti-calculus and anti-fever; *Cirsium congestum* and *Crocus haussknechtii* as anti-septic for gastric; *Colchicum kotschyi* as treatment of rheumatism; *Consolida orientalis* as laxative and anti-parasite, *Ephedra ciliata* as anti-bacterial and anti-fever, *Euphorbia macroclada* as treatment of wart; *Lonicera nummulariifolia* as anti-fever, anti-diarrheal and sedative; *Nepeta persica* as carminative and anti-urticarial; *Noaea mucronata* and *Onobrychis elymaitica* as anti-calculus and kidney problems; *Opoponex hispidus as* antiseptic; *Prangos ferulacea* as laxative; *Periploca aphylla as* anti-inflammatory; *Prosopis farcta* as blood thinner and anti-diabetic (reduction of blood glucose); *Salvia palaestina* as women fertility and women infections; *Satureja khuzistanica* as indigestion; headache, women infections and diuretic; *Scrophularia deserti* and *Scrophularia striata* as *w*ound and burn

healing; *Stipa capensis* as treatment of nerve system problems and gastric discords; *Tamarix ramosissima* as treatment of dermal discords, wound healing and sputum ; *Thymbra spicata* as treatment of cough, antibacterial and carminative; *Ulmus glabra* as treatment of heart discords and fertility discords; *Verbascum alepense* as anti-fever, dermal discords and wound healing; *Vitex pseudo-negundo* as increased milk; *Nicotiana tabacum* as treatment animal *(*Anti-leech and anti-*dermatophytosis*).

**Figure 4:** Landscape of cover plants on rangelands in Ilam province, Iran

Our study contributed confirmed the ethnobotanical knowledge of Abdanan and Dehloran districts, filling a long overlooked gap. It once more remarked the relationship existing between plant diversity and the degree of ethnobotanical knowledge recorded. The former has been retained thanks to a long history of nature preservation in the study area. It is worth highlighting that we found some young people who still retain ethnobotanical knowledge or at least express interest towards traditional uses, so that they performed well as key informants. This clearly derives from the cultural and professional opportunities offered by living in a famous protected area where nature is still an important issue for local communities. However, even under these circumstances many uses have disappeared and some forgotten by otherwise experienced informants. We believe that cultural diversity should be seen in a broader sense as part of biodiversity of a region, especially where disentangling human influence and nature is virtually impossible. Traditional knowledge should therefore feature more often in the agendas of nature reserves besides biological richness as a value to preserve for the future. In general, the people of the study area still have a strong belief in the efficiency and success of medicinal plants. The results of our study reveal that some of the plant species do play an important role in the primary healthcare system of this tribal community.

## Acknowledgment

The authors are thanking the tribal people for providing information on the medicinal uses of plants.

**Appendix 1**

1. Date
2. Village
3. Informant name and surname
4. Age
5. Degree of education
6. Family origins
7. Which wild plants do you use to treat the different ailments?
8. How you have learned to recognize them?
9. Which plant parts do you use?
10. What is the vernacular name of these plants/part plants?
11. Can you describe the preparation of remedy in detail?
12. When should the medicine be taken and for how long?
13. Internal or external administration?
14. Where does this knowledge arrive from?

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