

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

*Ghasemi Pirbalouti, A., Momeni, M. and **Bahmani, M.

*Researches Centre of Medicinal Plants and Ethno-veterinary, Islamic Azad University, Shahrekord, Branch, PO Box 166, Shahrekord, Iran , **Food and Beverages safety Research Center, Urmia University of Medical Sciences, Urmia, Iran.

*E-mail: ghasemi@iaushk.ac.ir

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 Abadan 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 31° 58' to 34° 15' N and longitude 45° 24' to 48° 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 (Kabirkooch 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 -15°C in north and summer is day with maximum temperature between 45°C 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 Abadan 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 Abadan 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: Abadan, 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, shepherding 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

- 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	<i>Achillea biebersteinii</i> 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	<i>Adiantum capillus-veneris</i> 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	<i>Adonis dentate</i> Delile.	Ranunculaceae	Gol Zarde	Cheshme Khorous, Gol Khorousak	Adonis, bird's eye	H	Annual	Flower	Internal	digestive discords and indigestion, Joundice
4	<i>Alhagi persarum</i> 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	<i>Allium akaka</i> 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	<i>Allium ampeloprasum</i> L. subsp. <i>iranicum</i> Wendelbo	Aliaceae or Liliaceae	Tareg	Tareh Koochi, 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	<i>Alcea angulata</i> (Freyn & Sint) Freyn & Sint. Ex Iljin	Malvaceae	Gole hirou	Khatmi	Mallow	H	Perennial	Roots	External/Internal	Burn, cut wound and emollient
8	<i>Alyssum minus</i> (L.) Rothm.	Brassicaceae	Ghedameh	Ghodomeh	Alyssum	H	Annual	Fruits	Internal	Emollient, cough, sore throat and eyes discords
9	<i>Amygdalus arabica</i> Olivier.	Rosaceae	Bayem, Vayem	Badam-e-Koochi	Almond	T	Perennial	Fruits	Internal/External	Child ear pain, body pain (for animal) and analgesic, bronchitis, anti-calculus and digestive discords
10	<i>Amygdalus lycioides</i> Spach.	Rosaceae	Taneges	Tangras	Almond	T	Perennial	Fruits	External	Good hair condition
11	<i>Rhamnus pallasii</i> Fisch. & C. A. Mey	Rhamnaceae	Arjan	Siah tangress	Buckthorn	S	Perennial	Fruits	Internal	Cold, emollient, cough and sore throat
12	<i>Anthemis altissima</i> L.	Asteraceae	Babineh	Babooneh	Chamomile	H	Annual	Flower	External/Internal	Indigestion and skin whitening
13	<i>Aristolochia olivieri</i> Collegno in Boiss.	Aristolochiaceae	Zaravand	Chopoghak	Dutchman's-pipe	H	Perennial	Leaves, Stem	External	Dermal discords and wound

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

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

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

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

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

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

				pahn	vetch					
116	<i>Viscum album</i> L.	Loranthaceae	Darpechanak	Darvash	White mistletoe	T	Perennial	Leaves, Stem, Flowers	External/Internal	Body pain, knew joint pain and abscess
117	<i>Vitex pseudo-negundo</i> (Hausskn.) Hand-mzt.	Verbenaceae	Keref, Kerof	Bangaro	Chaste tree	S	Perennial	Leaves	Internal	Increased milk
118	<i>Xanthium spinosum</i> L.	Asteraceae	Chazanak	Zardineh	Cocklebur	H	Annual	Leaves and Fruits	External	Dermal discords, diuretic
119	<i>Xanthium strumarium</i> L.	Asteraceae	Chazanak	Zardineh	Cocklebur	H	Annual	Leaves and Fruits	Internal	Laxative, stomach, tonic
120	<i>Ziziphora capitata</i> L.	Lamiaceae	Kakooti	Moshk taramoshk	Ziziphora	H	Annual	Leaves and Inflorescence	Internal	Spice and culinary
121	<i>Ziziphus nummularia</i> (Burm. F.) Wighth & Arn.	Ramnaceae	Darak, Konar	Ramlik	Camel thorn	T	Perennial	Leaves and Fruits	External	Gastric pain and stomachic
122	<i>Ziziphus spina-christi</i> (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

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

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

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.

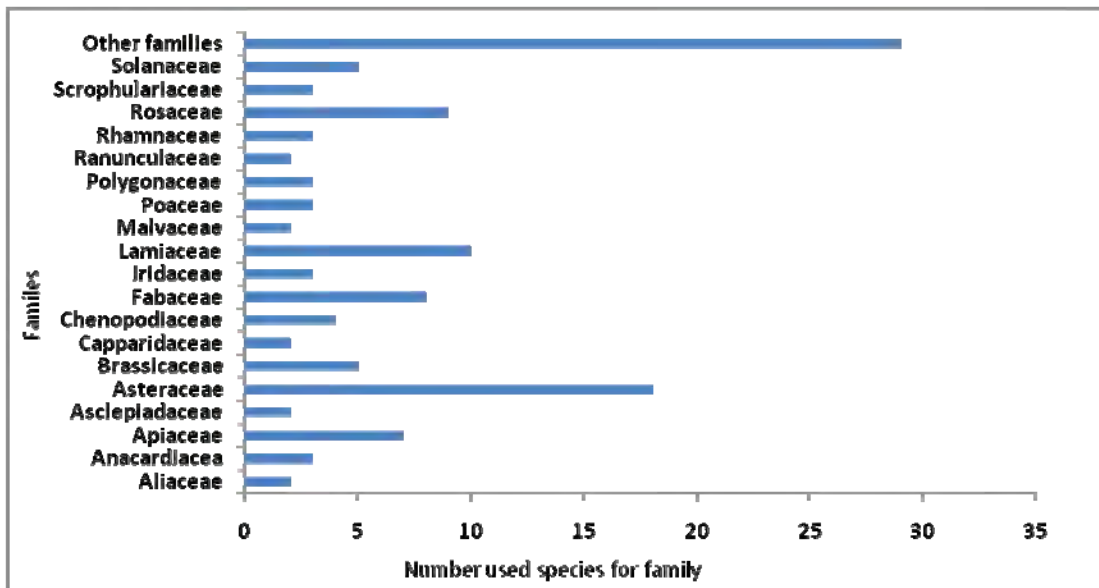


Figure 1: Frequency of plant families used in Dehloran and Abdanan district, Ilam province, Iran

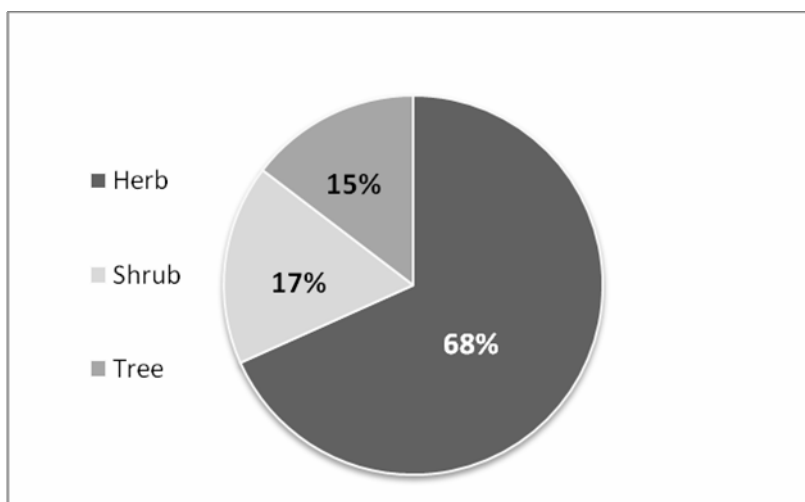


Figure 2: Frequency of habit plants used in Dehloran and Abdanan district, Ilam province, Iran

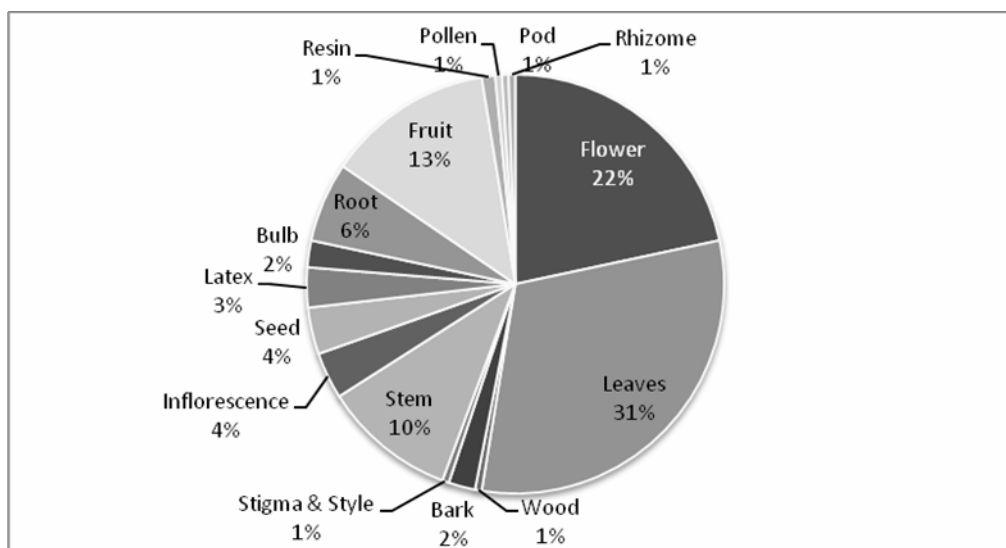


Figure 3: Frequency of plant parts used in Dehloran and Abdanan district, Ilam province, Iran

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-lice 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 intricata* and *Picnemon 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 wound and burn

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