Ethnobotanical study of medicinal plants used in Ahar-Arasbaran (protected area in East Azerbaijan Province of Iran)

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Abstract. Iran is an ancient country in the usage of medicinal plants and Ahar is considered one of the richest regions of medicinal plants. The traditional knowledge about medicinal plants is the basic step in many drug productions and these kinds of information should be documented through botanical investigations. The present study is the first survey conducted in this region and its primary point is to distinguish such plants and to present their application in traditional medicine. In this study, the data was gathered by talking with indigenous individuals to identify medicinal plants with local importance developed during the 2015 and 2016 growing seasons. Scientific names and therapeutic uses are also mentioned. The results obtained from the present study indicated that there were 45 medicinal species of 23 families in Ahar and local people mainly used Lamiaceae and Asteraceae then Rosaceae, Brassicaceae and Fabaceae medicinal taxa. Medicinal plants were mostly used to treat intestinal-digestive disorders, for cold treatment and for soothing pain. According to results, significant ethnobotanical data on medicinal plants gives premise information to future pharmacological and phytochemical studies. Also, this document can be utilized as a part of protecting indigenous knowledge.

Keywords. Ahar; Ethnobotany; Medicinal plants; Traditional medicine.

Study etnobotánico de las plantas medicinales utilizadas en Ahar-Arasbaran (área protegida en la provincia irani de Azerbaijan del este)

Resumen. El uso de las plantas medicinales en Irán es conocido desde la antigüedad y Ahar está considerado una de las regiones más ricas en su uso. El conocimiento tradicional de las plantas medicinales es el paso básico en la producción de muchas drogas. Este tipo de información se debería recoger y anotar durante las investigaciones botánicas. El presente trabajo es la primera investigación de este tipo llevada al cabo en esta región. El objetivo principal de este estudio es reconocer las plantas y describir su uso en la medicina tradicional. Durante la época de floración en los años 2015 y 2016 se entrevistaron los habitantes indígenas de la región y se recogió la información relevante sobre la identificación de las plantas medicinales del interés local. Se adjudicaron los nombres científicos y el uso terapéutico de las plantas. Los resultados obtenidos en el presente trabajo indican la presencia de 45 especies de plantas medicinales pertenecientes a 23 familias en Ahar, en su mayoría Lamiaceae y Asteraceae, seguido por Rosaceae, Brassicaceae y Fabaceae. Las plantas medicinales se usan mayoritariamente para tratar las molestias del tracto digestivo, el resfrío y también para calmar el dolor. Los resultados demuestran que se han obtenido unos datos etnobotánicos significativos que permiten llevar al cabo futuros estudios farmacológicos y fitoquímicos de las plantas estudiadas. Además, el presente documento se puede usar para proteger el conocimiento indígena de la zona.

Palabras clave. Ahar; etnobotánica; plantas medicinales; medicina tradicional.

Introduction

Ethnobotany is the study of how individuals of a specific culture and area utilize local plants. The history of using the medicinal plant to cure diseases goes back to ancient history. By far most of the information is still in the hands of customary healers and data of healers is either lost or go to age by the verbal. In this manner, the ethnobotanical examination tries to report the information of the healers with a specific end goal to save it for some time later (Seifu, 2004; Boucherit et al., 2017; Medjati et al., 2019). Botanical collection of the related ethno-organic information ought to be done before such rich legacies are lost because of different anthropogenic and other characteristic causes (Martin, 1995).

Iran with a background of thousand years of social and ethnic diversity, atmosphere and climate decent variety and richness of more than 8000 species is an appropriate instance of ethnobotanical contemplates. Iran has a long history of utilizing customary medicinal plants for fighting different diseases, which goes back to the season of Babylonian-Assyrian development. One of the most significant ancient heritages is a sophisticated experience of individuals who have attempted throughout the centuries to find helpful plants for wellbeing change and every age added their understanding to this convention (Naghibi et al., 2005). Today, therapeutic plants are still generally utilized in all urban communities and towns of Iran, in particular, stores (named Attar), which customary healers (Attar)
Ethnobotanical data collection

In order to gather information on medicinal species found in the Ahar-Arasbaran protected area, an investigation was performed during two growing seasons of 2015–2016 from April to September and all plant species encountered during field observations were recorded. Also, questionnaires were given administered to the local people, through face to face interviews. More than 100 informants (Attar) within the age of 37 to 82 including males and females were interviewed. Ethnobotanical information, including the various data such as name and age of informants, local names, and purpose of usage, preparation procedure, and duration of the treatment were obtained through interviews and discussions. Subsequently, specimens of the reported medicinal plants were identified by a specialist with the help of available Floras (Rechinger, 1963–2009; Assadi et al., 1988–2008) and consulting with different herbal literature (Zargari, 1989–1992; Hooper & Field, 1937) at the Ahar, Arasbaran protected area. Based on the floristic regions division, Ahar belongs to the Irano-Turanian region (Armeno-Iranian province, Atropatanean sub-province; Takhtajan, 1986).
plant species were checked for accuracy according to the plant list (www.theplantlist.org).

Results

The present ethnobotanical survey gathered information on 45 plant species reported by the informants for their medicinal use (see Appendix 1). The species belong to 42 genera and 23 families. Different parts of medicinal plants (roots, leaves, fruits and seeds, latex, etc.) were used by the local inhabitants as medicines (23). Leaf (52%) and flower (22%) followed by seed (9%), shoot (9%), fruit (4%), latex (2%) and root (2%) were among the most widely used medicinal parts (Figure 2). As shown in Figure 3, Lamiaceae (9 species) and Asteraceae (5 species) were the most frequently used families in the area, followed by Rosaceae, Brassicaceae and Fabaceae families each with three species.

Our research showed that the species of Lamiaceae (*Mentha longifolia*, *Nepeta menthoides*, *Stachys lavandulifolia*, *Stachys schtschegleevii*, and *Thymus kotschyanus*) are mostly used for the treatment of common cold. Moreover, the use of following plants is very common as a treatment for different disease among people: *Achillea millefolium* (stomach pain), *Althaea officinalis* (fever), *Cydonia oblonga* (cough), *Eremostachys laciniata* (rheumatism and cramps), *Malva neglecta* (pneumonia), *Peganum harmala* (infections), *Plantago major* (diarrhoea), and *Viola ignobilis* (pneumonia).

The results obtained from the present study indicate that medicinal plants of the Ahar-Arasbaran protected area are used in the treatment of different diseases, particularly for intestinal-digestive disorders (22%), soothing pain (22%), cold (20%), infections (13%), skin and hair disorders (6%), heart-blood circulatory system disorders (7%), respiratory disorders (4%), kidney and urogenital diseases (2%), menstruation and fertility disorders (2%) and muscle cramps (2%; Figure 4).

![Figure 2. Distribution of plant parts used in taxa](image)

![Figure 3. Number of species per family with medicinal importance found in the study area.](image)
Discussion

The Ahar-Arasbaran protected area comprises great biodiversity of plant species, a variation of climatic and also different ecological habitats such as mountains, hills, plains, valleys, and rivers. It appears that there are many medicinal uses for the treatment of different diseases in the studied area which were rarely revealed before this. According to the current study, Lamiaceae and Asteraceae were the dominant locally used families (Figure 3) and in the previous studies on the medicinal plants in Iran, these families were in the first or second rank (Akbarinia et al., 2006; Mirdavodi & Babakhanlo, 2007). This is not unexpected due to the wide diversity and dispersal of these families in the flora of Iran (Assadi et al., 1988–2008).

Medicinal plants in Ahar-Arasbaran are used mainly to soothe pain and to treat intestinal-digestive disorders and common cold. All of them are very common ailments in this cold and mountainous region.

However, there are some important medicinal species in the studied region such as Echinophora platyloba, Ferula gummosa, Foenicum vulgare (Apiaceae), Achillea wilhelmsii, Centaurea depressa, Cichorium intybus, Echinops ritrodes (Asteraceae), Alyssum linifolium (Brassicaceae), Ziziphora tenuior (Lamiaceae) which are not used for the medicinal purposes by local people in Ahar. Moreover, some toxic plants were recorded, e.g. Hyoscyamus reticulates, Datura stramonium, the people avoid them because of their high toxicity.

The results of our survey show that some of the plant species play an important role in the primary healthcare system of this tribal community. This investigation shows that although people in the studied area have access to modern medical facilities, a lot of them continue to use medicinal plants for the treatment of healthcare problems. Also, this study demonstrates significant ethnobotanical information on medical plants which can be used as pattern information for future pharmacological and phytochemical surveys.

It is trusted that the rational utilization of local medicinal plants along with effective synthetic drugs may have a benefit and can improve the quality of life and living standards of the native inhabitants (Namsa et al., 2011; Oliveira et al., 2011). Regardless of the significance of these plants for health improvement, it appears that probably the most encouraging restorative plants have not yet been completely recognized. For this reason, documentation of the indigenous knowledge through ethnobotanical studies is important for the conservation and utilization of biological resources (Muthu et al., 2006).

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Appendix 1. List of medicinal plant species of the study area and their uses.

| Scientific name              | Family               | Local name      | Habit | Part used | Ailment treated                                      |
|------------------------------|----------------------|-----------------|-------|-----------|------------------------------------------------------|
| Achillea millefolium         | Asteraceae           | Boymadaran      | Herb  | Flowers   | Stomach pain, parasitic infections                    |
| Alhagi maurorum              | Fabaceae             | Dava gharni     | Herb  | Leaves    | Infections, kidney stones                             |
| Althaea officinalis          | Malvaceae            | Khatmi goli     | Herb  | Flowers   | Fever, hiccup                                        |
| Anchusa strigosa             | Boraginaceae         | Pishir fagheghi | Herb  | Flowers   | Cough, intestine pain                                 |
| Cannabis sativa              | Cannabaceae          | Chatana         | Herb  | Seed      | Analgesic, aphrodisiac                                |
| Capsella bursa-pastoris      | Brassicaceae         | Pishir dirnaghi | Herb  | Leaves    | Fever, hemorrhage                                    |
| Capparis spinosa             | Capparidaceae        | Ilan gharpizi   | Herb  | Fruit     | Migraine                                             |
| Chenopodium album            | Amaranthaceae        | Yaghlija        | Herb  | Leaves    | Strengthen the digestive system                       |
| Cistus arvense               | Asteraceae           | Gangal          | Herb  | Shoots    | Appetizer                                            |
| Cydonia oblonga              | Rosaceae             | Heyva           | Tree  | Seed      | Cough, cardiotonic                                   |
| Cynodon dactylon             | Poaceae              | Chayir          | Herb  | Leaves    | Fever                                                |
| Descurainia sophia           | Brassicaceae         | Shovaran        | Herb  | Seed      | Thirst, laxative                                     |
| Euphorbia helioscopia        | Euphorbiaceae        | Soddian         | Herb  | Latex     | Parasitic infections                                 |
| Eremostachys lacinata        | Lamiaeae             | Chelleh daghi   | Herb  | Roots     | Rheuma, cramps, heel spurs disease                   |
| Falcaria vulgaris            | Apiceae              | Ghaz ayaghi     | Herb  | Leaves    | Skin wounds                                          |
| Fumaria asaepala             | Papaveraeae          | Shah tarasi     | Herb  | Leaves    | Fever                                                |
| Galium aparine               | Rubiaceae            | Bitirakh        | Herb  | Shoots    | Wounds, skin diseases                                |
| Glycyrhiza glabra            | Fabaceae             | Shirinbayan     | Herb  | Leaves    | Stomachic                                            |
| Heracleum persicum           | Apiceae              | Baldirgan       | Herb  | Fruit     | Sedative, to increase breast milk supply             |
| Isolirion tataricum          | Liliaceae            | Khiyarak        | Herb  | Shoots    | Joint pain, skin booster                             |
| Lamium album                 | Lamiaeae             | Gigi tikan      | Herb  | Flowers   | Sedative, analgesic                                  |
| Malva neglecta               | Malvaeae             | Aman komangi    | Herb  | Leaves    | Pneumonia                                            |
| Mentha longifolia            | Lamiaceae            | Yarpiz          | Herb  | Leaves    | Common cold                                          |
| Muscaria neglectum           | Liliaceae            | Garga soghani   | Herb  | Flowers   | Digestive problems                                   |
| Nasturtium officinale        | Brassicaceae         | Bolagh oti      | Herb  | Leaves    | Analgesic                                            |
| Nepeta menthoides            | Lamiaeae             | Oshi ghodus     | Herb  | Flowers   | Common cold                                          |
| Ocimum basilicum             | Lamiaeae             | Reyhan          | Herb  | Leaves    | Common cold                                          |
| Peganum harmala              | Zygophyllaceae       | Ozarrik         | Herb  | Seed      | Infections, stomach pain                             |
| Plantago major               | Plantaginaceae       | Bizosha         | Herb  | Seed      | Diarrhoea                                            |
| Rosa damascena               | Rosaeae              | Ghzel goli      | Shrub  | Flowers   | Sedative, analgesic                                  |
| Rosa canina                  | Rosaeae              | It borni        | Shrub  | Flowers   | Cough, headache                                      |
| Rumex chalepensis            | Polygonaceae         | Avalih          | Herb  | Leaves    | Laxative                                             |
| Salix aegyptica              | Salicaceae           | Pish pish       | Tree   | Flowers   | Laxative, sedative, cough, bloating                  |
| Salvia nemorosa              | Lamiaeae             | Maryam goli     | Herb  | Leaves    | Digestive, menstrual crumps, headache                |
| Sophora pachycarpa           | Fabaceae             | Ajibayan        | Herb  | Flowers   | Analgesic, parasitic infections                      |
| Stachys lavandulifolia       | Lamiaeae             | Tohloja         | Herb  | Leaves    | Common cold                                          |
| Stachys schtscheleevii       | Lamiaeae             | Sataljam alaghi | Herb  | Leaves    | Common cold                                          |
| Tanacetum balsamita          | Asteraceae           | Shahsparam      | Herb  | Leaves    | Blotting, stomach pain                                |
| Taraxacum syriacum           | Asteraceae           | Khabarak        | Herb  | Flowers   | Blotting                                             |
| Thymus kotschyanus           | Lamiaeae             | Kahlik oti      | Herb  | Leaves    | Common cold                                          |
| Tragopogon geumifolius       | Asteraceae           | Yem lik         | Herb  | Leaves    | Laxative                                             |
| Trifolium pratense           | Rosaceae             | Damirikani      | Herb  | Flowers   | Infections                                           |
| Urtica dioica                | Urticaceae           | Dalama          | Herb  | Leaves    | Analgesic                                            |
| Verbascum cheiranthifolium   | Scrophulariaceae     | Siguyrughi      | Herb  | Leaves    | Analgesic, hemorrhoids                               |
| Viola ignobilis              | Violaceae            | Banoshah        | Herb  | Leaves    | Pneumonia                                            |