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An Ethnobotanical Study of Hepatoprotective Herbs from Shahrekord, Chaharmahal and Bakhtiari Province, Southwest of Iran

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BACKGROUND and objective: Hepatoprotection using herbal drugs and preventing very common liver disease is very necessary in today's world. Therefore, this ethnobotanical study was conducted to identify and report medicinal plants in Shahrekord with hepatoprotective effect. Factors such as oxidative stress, free radicals, white alcohol, chemicals, pesticides, heavy metals, viruses and drugs can cause liver tissue damage. **Methods**: In this ethnobotanical study, indigenous knowledge about medicinal plants used as hepatoprotective agents in Shahrekord was investigated from 21 April 2017 to 19 February 2018 by referring to 29 traditional therapists in the region under study and administering a questionnaire to them. The results of the questionnaires were consistently tabulated. Data were finally analyzed by the Excel software. Frequency of rate was also calculated and reported. **Results**: The results showed that in Shahrekord, 15 medicinal plant species from 9 herbal families consisting of *Silybum marianum*, *Nigella sativa*, *Cichorium intybus* L., *Rheum ribes* L., *Alyssum* spp., *Fumaria* spp, *Melilotus officinalis* (L.) Lam, *Descurainia sophia* (L.) Prantle, *Taraxacum officinale*, *Malva sylvestris* L, *Rumex pulcher* L., *Melissa officinalis* L, *Alhagi maurorum*, *Alcea* spp. and *Echinophora platyloba* DC. from a total of six plant families are used as hepatoprotective plants. **Conclusion**: Due to the importance of herbs in Shahrekord, and their high use and consumption by the people, the results of this ethnobotanical study can provide a good basis for more scientific use of medicinal plants to produce products with higher efficacy and less harms.

Keywords: Ethnobotany, Hepatoprotective, Iran, Liver, Medicinal plants, Shahrekord.

Introduction

Liver is one of the vital organs of the body that are important in regulating many physiological phenomena. Liver dysfunction causes a series of physiological and anatomical disorders and various types of diseases. This organ plays a major role in many essential physiological processes, such as glucose homeostasis, production of essential for plasma proteins, the production of lipoprotein and lipids, production and secretion of bile acids and storage of vitamins [1]. The causes of some liver diseases are unknown, but undoubtedly oxidizing agents play an important role in causing changes in the pathology of the liver, especially in hepatotoxicity and alcoholic liver. For example, these compounds, through peroxidation of unsaturated fatty acids, impair the biological membranes of cell membrane structure and cause pathological changes [2]. Factors such as oxidative stress, free radicals, white alcohol,

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chemicals, pesticides, heavy metals, viruses and drugs can cause liver tissue damage [3]. Liver damage can be mild or severe and leads to fibrosis and cirrhosis of the liver [4]. The involvement of free radicals in the development of many diseases has been obviously demonstrated [5]. Different biochemical reactions in the body produce radicals that are capable of destroying large molecules. The antioxidant compounds stop these adverse effects, scavenge free radicals and lead to detoxification [5]. With the discovery of antioxidant compounds in plants in recent years, the use of medicinal plants has been welcomed in recent years. Medicinal plants are used to treat various diseases of different organs of the body, such as the heart, gastrointestinal tract, liver, brain and nerves, the genitourinary and musculoskeletal systems, and other organs of the body [6,7]. Hepatoprotection using herbal drugs and preventing very common liver disease as well as phytotherapy for these diseases is very necessary in today's world. Taken together [8-13], this ethnobotanical study was conducted to report medicinal plants in Shahrekord with hepatoprotective effect.

Methods

General methodological information

In this ethnobotanical study, indigenous knowledge about medicinal plants that are used as hepatoprotective agents in Shahrekord was investigated from 21 April 2017 to 19 February 2018 by referring to 29 traditional therapists in the region under study in person and administering a direct questionnaire to them. The language of the traditional Persian speakers and therapists. The questionnaire was carefully explained to traditional therapists and their traditional information was recorded in the questionnaire. Validity of the questionnaire has been confirmed based on previously published articles.

Botanical

The present study was based on traditional information and traditional knowledge of traditional therapists. Traditional information was collected by interview.

Anthropological

The criteria for entering the study were traditional adjuvants and traditional therapists in the city of Shahrekord. The number of the participants 29 people

Floristic inventory

No herbarium specimen was prepared and only traditional information was collected from individuals. Indigenous and Persian names of plants were collected from the interviewees and scientific names were confirmed by Ghasemi Pirbalouti (2009).

Survey and Data Collection

Information was obtained from people who traditionally treated with medicinal herbs. These people were traditional therapists who shop for medicinal plants. In this ethnobotanical study, indigenous knowledge about medicinal plants that are used as hepatoprotective agents in Shahrekord was investigated from 21 April 2017 to 19 February 2018 by referring to 29 traditional therapists in the region under study in person and administering a direct questionnaire to them (The sample questionnaire is attached (Appendix1)).

Shahrekord is the capital city of Chaharmahal and Bakhtiari Province, Iran. It is the largest city in the province, and is 90 km away from Iran's third largest city, Isfahan. At the time of the 2006 census, Shahrekord had a population of about 148,464 and the Shahrekord metropolitan area had a population of 380,312. Shahrekord is known for its natural environment, cold winters, waterfalls and rivers.[citation needed] Shahr-e Kord is Iran's highest capital city at 2,070 m (6,790 ft) above the sea level. This led the city to be known as "Roof of Iran". Shahr-e Kord is at a distance of 521 km (324 mi) southwest from Tehran. Shahrekord's map is shown in Fig. 1.

These questionnaires included demographic information and specialized information on medicinal plants. The respondents referred to the therapists in person to record their information and beliefs about phytotherapy. Out of 29 people, 8 were female and 21 male. Their education level was from high school diploma to master's degree. The results of the questionnaires were consistently tabulated. Data were finally analyzed by the Excel software. In this study, the frequency of plant use was calculated by the following formula:

Frequency of rate = (Number of people who have mentioned the plant effect divided by total number of people who filled out questionnaires) × 100

Statistical analysis

Calculating the number and percentage of each family, plant organs and traditional use in Excel software.

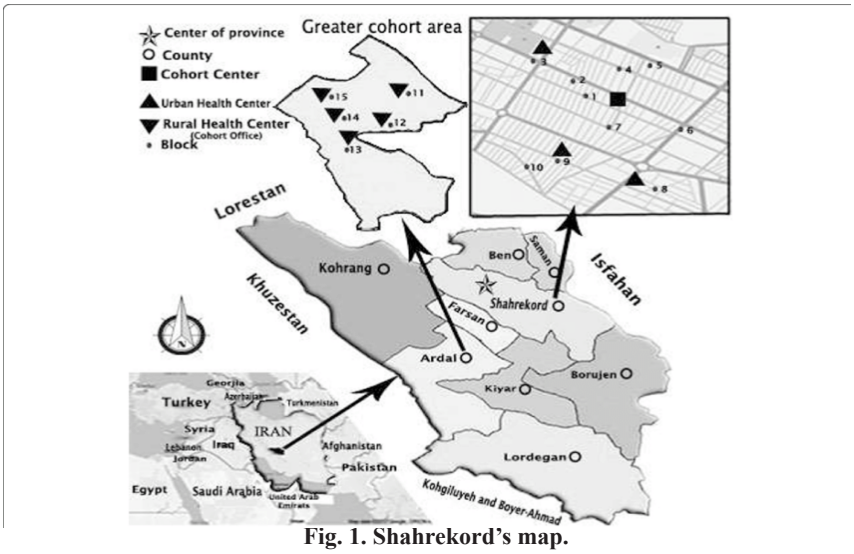

Fig. 1. Shahrekord's map.

Ethical consent

The study was explained to respondents and informed consent was received from each respondent

Results

The analysis of data drawn from the questionnaires in this study showed that in Shahrekord, 15 medicinal plant species from 9 herbal family consisting of *Silybum marianum*, *Nigella sativa*, *Cichorium intybus* L., *Rheum ribes* L., *Alyssum* spp., *Fumaria* spp, *Melilotus officinalis* (L.) Lam, *Descurainia sophia* (L.) Prantle, *Taraxacum officinale*, *Malva sylvestris* L, *Rumex pulcher* L., *Melissa officinalis* L, *Alhagi maurorum*, *Alcea* spp. and *Echinophora platyloba* DC. from a total of six plant families are used as hepatoprotective plants. Additional information on hepatoprotective medicinal plants in Shahrekord is presented in Table 1.

As shown in Table 2, most plants (n: 3) belong to the Asteraceae family. Distribution of other plant families with hepatoprotective effects in Shahrekord is shown in Table 1.

As shown in Table 2, the most frequently used organs were aerial organs (40%), followed by the leaf (25%). The percentages of other plant organs with hepatoprotective effects in Shahrekord are illustrated in Table 3.

According to the results obtained from this study, the most commonly traditional used form of the medicinal herbs as hepatoprotective was 44% for brewed (infusion). Other information on how traditional use is shown in Table 4.

Discussion

The liver is the main organ of metabolism, secretion and excretion of materials, and is constantly exposed to various types of internal and external compounds. The prevalence of liver diseases in the world is increasing and synthetic chemical drugs, besides being completely unsafe in the treatment of these diseases, have unwanted side effects, therefore, it is necessary to introduce a real alternative drug for liver disease to the world of medicine [13]. This study is an ethnobotanical study with the aim of identifying indigenous medicinal plants of Shahrekord traditionally used as hepatoprotective agents in the ethnobotany of the region under purpose. The results of this study showed that the medicinal plants of *Silybum marianum*, *Nigella sativa*, *Cichorium intybus* L., *Rheum ribes* L., *Alyssum* spp., *Fumaria* spp, *Melilotus officinalis* (L.) Lam, *Descurainia sophia* (L.) Prantle, *Taraxacum officinale*, *Malva sylvestris* L, *Rumex pulcher* L., *Melissa officinalis* L, *Alhagi maurorum*, *Alcea* spp. and *Echinophora platyloba* DC. are used as hepatoprotective plants in Shahrekord. The liver is the largest internal organ of the human body and one of the most important ones, and its health is somehow tied to the overall health of the human body. If the liver does not function properly, these conditions can lead to the weakening of the human immune system and cause many health issues. Medicinal plants can be used to cleanse the liver and strengthen the immune system. The liver produces bile, which helps fat metabolism and eliminates toxins present in the blood. Using medicinal plants can help with these processes.

TABLE 1. Scientific name of plants, plant family, local name, organs used, frequency of use of medicinal plants used as hepatoprotective agents in Shahrekord.

Scientific name	Herbal family	Local name	Frequency of rate	Used organs	How to traditional use
Echinophora platyloba DC.	Apiaceae	Khosharizeh	3%	Aerial organs	Decoction
Silybum marianum (L.) Gaertn.	Asteraceae	Khar maryam	6%	Aerial organs, flower	Decoction, brewed
Cichorium intybus L.	Asteraceae	Kasni	17%	Aerial organs	Decoction, brewed, Fresh herb consumption
Taraxacum officinale (L.) Weber ex F.H.Wigg.	Asteraceae	Ghasedak	3%	Aerial organs	Brewed
Alyssum spp.	Brassicaceae	Ghodoumeh	6%	Aerial organs	Decoction
Descurainia sophia (L.) Webb ex Prantl	Brassicaceae	Khakshir	6%	Seed	Decoction, brewed, Fresh herb consumption
Melilotus officinalis (L.) Pall.	Fabaceae	Aklilolmolk	6%	Aerial organs	Brewed
Alhagi maurorum Medik.	Fabaceae	Kharshotor	3%	Aerial organs	Brewed
Fumaria spp.	Fumariaceae	Shatareh	17%	Leaf, stem	Brewed, Fresh herb consumption
Melissa officinalis L.	Lamiaceae	Badranjbouyeh	3%	Aerial organs	Brewed
Malva sylvestris L.	Malvaceae	Panirak	3%	Leaf	Decoction, brewed, Fresh herb consumption
Alcea spp.	Malvaceae	Gole khatmi	3%	Flower, leaf	Decoction, brewed, Fresh herb consumption
Rheum ribes L.	Polygonaceae	Rivas	1%	Leaf, stem	Brewed, Fresh herb consumption
Rumex pulcher L.	Polygonaceae	Torshak	3%	Leaf, stem	Decoction, brewed, Fresh herb consumption
Nigella sativa L.	Ranunculaceae	Siah daneh	3%	Seed	Decoction, brewed, powder

TABLE 2. The number of plant family as hepatoprotective in Shahrekord

Herbal family	Number(s)
Asteraceae	3
Ranunculaceae	1
Polygonaceae	2
Brassicaceae	2
Fumariaceae	1
Fabaceae	2
Malvaceae	2
Lamiaceae	1
Apiaceae	1

TABLE 3. Number and percentage of plant organs used as hepatoprotective agents

Plant organs	Number	percentage
Flower	2	%10
Aerial organs	8	%40
Seed	2	%10
Leaf	5	%25
Stem	3	%15

TABLE 4. Percentage and number of traditional use of plants in this study

How to use	Number	percentage
Decoction	9	%30
Brewed (infusion)	13	%44
Powder	1	%3
Fresh herb consumption	7	%23

As it was said most of medicines plants have been in use for a long time for various disease including liver conditions with no reported major adverse effects. Therefore, they generaly should be considered as reliable and safe remedies [14-17]. However, for most of these plants there are no reliable data from experimental and clinical randomized controlled trials to support their safety and efficacy. The data provided in this article might be useful for the use and research in this area. In spite of the significant popularity for medicinal plants in general, limited plants have gained acceptable treatment modalities for hepatopathogenesis conditions. Although lack of experimental and randomized controlled clinical trials on safety and efficacy might be the main limiting factors in widely use of medicinal plants in liver disease, lack of standardization of these plants or their preparations as well as lack of enough knowledge on their active ingredients are important factors.

From the plants introduced here, Sylibum marianum is the most important one which has gained popularity for use. It has antioxidative, antilipid, antifibrotic, and anti-inflammatory activities, as well as immunomodulatory and hepatoprotective properties. Its hepatoprotective mechanism has widely been recognized [18]. Glycyrrhiza glabra is also an effective hepatoprotective and anti-inflammatory plant. It is able to induce an endogenous interferon. These two plants have promising effects on live complication [18].

Conclusion

Liver disease stand for one of the foremost health problems in the world. The available medicines are often limited in safety and efficacy, and most of them are expensive. Therefore, use of herbal compounds are highly attractive. We aimed in this study to collect the ethnobotanical data to identify and report medicinal plants in Shahrekord with hepatoprotective effects which might be useful for health professionals, researchers working in the field of therapeutics and pharmacology to develop evidence-based alternative medicine to treat various kinds of liver problems.

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Conflict of interest

The authors stated that there was no conflict of interest.

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