



Ethno-botanical medicines used for urinary stones in the Urmia, Northwest Iran



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ABSTRACT

Introduction: Ethnomedicinal studies are one of the important routes to find potential medicinal plants for drug discovery purposes. In this study, we aimed to consider ethnopharmacological remedies used for urinary stones in Urmia, northwest Iran.

Methods: This work was based on interviews and questionnaires with traditional healers. All the mentioned medicinal herbs were collected and identified with the help of traditional healers in the city and suburb.

Results: There were 47 traditional healers working in the spice shops (*Attari*) in Urmia and 35 of them agreed to cooperate with us. 16 medicinal herbs from 13 families were mentioned by traditional healers. Brassicaceae, Fabaceae and Rosaceae were the predominant families with 2 plants most commonly reported. The most commonly used part was the aerial parts (41.1%). Also, the main method of preparation was decoction (72.7%). Five plants were mentioned by more than 70% of traditional healers as treatment for urinary calculi. *Alhagi camelorum* Fisch had the highest Frequency of Citation (FC) percentage 88% while the least FC percentage was exhibited by *Alyssum desertorum* Stapf. and *Ruta graveolens* L. which was 20%.

Conclusion: Pharmacological activities of reported plants in this study were searched in published works all around the globe. Findings show that most of examined *in-vitro*, *in-vivo* or human to prevent or treat urinary calculi. Also, for some plants, although no direct evidence exists for urinary calculi, it is likely that they may have an effect on urinary stones because of their active ingredients.

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1. Introduction

Urinary calculi is one of the most widespread urinary tract disorders. Its prevalence is reported to be between 1 and 5 percent worldwide and is increasing worldwide [1–3]. The ratio of male to female is 2:1 [4]. Nephrolithiasis is the third most prevalent urinary disease after urinary infectious and prostatic pathologic disorders [5]. In the US alone, 0.9 percent of hospitalized persons have urinary calculi and in 1993, the cost of this disease was reported as 1.83 billion US \$ in America [6]. Recent studies show that despite shifting treatments from inpatient to outpatient, the

cost of urolithiasis is increasing, and reached to 2 billion US \$ in 2005 due to the increasing prevalence of stone diseases [7,8]. More recently estimates suggested that the cost for urolithiasis is 6500 US \$ per year [9].

Forming stones is dependent on multiple factors including genetics, age, sex, weather conditions, living place, amount of water consumption, minerals of water, diet, etc. Current strategies for management of urinary calculi include increasing consumption of water and using diuretics and analgesics. Also, dissolving stones by chemicals, some invasive methods such as surgery, breaking stones by ultrasound waves, etc. are applied for bigger stones that cannot be exerted naturally. But these medical procedures are not completely successful and about 50% are recurrent. Also, the spread of this disease is increasing [1,2].

Therefore, finding new low cost treatment approaches or preventing agents is important and as one of the common trends in this disease. Natural products, ethnobotanical knowledge and also traditional and complementary systems of medicine are important

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sources in the search for new treatments based on ancient knowledge [10].

Iran is one of the countries located on the Asian stone-forming belt (the area from Sudan in Africa to Philippines in eastern Asia that all age groups are affected by urolithiasis) [4] which has a deep and remarkable history of medicine dating back thousands of years to ancient times [11]. In the early medieval period, medical sciences flourished under the Persians during the 9th–12th century AD. This period is called the Islamic Golden Age because of Persian physicians' influential works on medicine [12,13]. Persian medicine (humoral theory) was a global paradigm of medicine during ancient and medieval times. Some of the great Persian manuscripts such as the Canon of Avicenna or the Royal Book of Holy Abbas were taught and learned in the west until the 17th century [14,15]. Regarding ethno-medicine, due to its strong tradition it has become quite common and is practiced by traditional healers in Iran [16]. For example, a study in Isfahan (in the center of Iran) showed that 62.5% of urban population in this region used at least one traditional and complementary method [17].

As a result of the considerable interest in and popularity of this subject, two related PhD courses have been established in Iranian medical education during the last decade. It is possible for physicians to obtain a Ph.D. degree in Traditional Medicine during a 4 year course. Also, a Traditional Pharmacy (Phytopharmaceuticals) – Ph.D. degree – is available for pharmacists (with PharmD degree). These can be obtained through the schools of traditional medicine in the highest ranked Iranian universities such as Tehran, Shaheed Beheshti, Shahed, Isfahan, Mashhad, etc., Universities of Medical Sciences or departments of traditional medicine and pharmacy in the schools of pharmacy and medicine in Shiraz University of Medical Sciences. These courses are based on Persian Medicine (humoral theory) integrated with the current concepts of medicine. On the other hand, scientific approaches to traditional medicine and ethnopharmacology can reduce the risk of unwanted effects of such traditional methods.

As urinary calculi have always been an important problem in Iran [18], many ethno-pharmacological medicines can be found all around the country. These remedies have a deep root in traditional Persian medicine and have remained throughout history because of their effectiveness. In this regard, by scientific review and evaluating the ethnomedicines using current concepts of medicine, they can be considered as valuable sources to find new drugs, treatments and preventive approaches.

2. Method

2.1. Study area

Urmia is the center of West Azarbaijan province in the northwest of Iran (Fig. 1). This region is mountainous (lowest and highest altitudes of 1420 m and 2280 m, respectively) with cold and semi arid weather. February is the coldest and August is the warmest month of the year. The lowest and highest annual mean temperature is -15.5°C and 33.1°C , respectively. This region is full of medicinal plants [19]. Using ethno-medicines is common and many people practice these traditional methods as treatment of diseases including various types of urinary calculi. For this reason Urmia was chosen as our target to obtain ethno-pharmacological data and compare them with current findings in medicine to reach potential suggestions in prevention and treatment of urinary calculi.

2.2. Data collection

This ethnobotanical study was carried out between November 2013 and December 2013. The methodology of this work was based



Fig. 1. The situation of Urmia in northwest Iran.

on filling out questionnaires and also interviews with traditional healers. A list of traditional healers and also herbal medicines and spice shops (*Attari*) were collected with the help of the Vice Chancellor of Nutrition and Drugs, Urmia University of Medical Sciences. The questionnaire include information about interviewees and ethnobotanicals including their name, usage, part use, route of administration, method of preparation, prescription and instructions on use.

2.3. Collection and identification of plant species

All the mentioned medicinal herbs were collected with the help of traditional healers in the city and suburb. A herbarium specimen of each herb was prepared and sent to herbarium unit of Shahrekord University of Medical Sciences, identified by an herbalist and approved and numbered in the Herbarium Collection.

2.4. Data analysis

All the gathered data were sorted in the Excel 2007 software and analyzed. The ethnopharmacological effects of medicinal herbs were compared with current findings and an attempt was made to present a list of potential natural remedies to find new drugs by future investigations. Also, the frequency of citation of each plant was calculated. It is calculated as percentage of ratio of the number of herbalists referred to each plant as remedy for urinary calculi to the total number of herbalists [20].

3. Results

There were 47 traditional healers (herbalists) working in the spice shops (*Attari*) in Urmia, 35 of whom agreed to cooperate with us. All of them were men, over 18 years old and reported that they saw patients with diabetes who had been diagnosed with a laboratory blood test. A total of 16 medicinal herbs from 13 families were mentioned by traditional healers and numbered in the Herbarium Collection (Table 1). Fig. 2 shows number of plant species per family. As can be seen in the Fig. 3, the most commonly used plant part were the aerial parts and decoction was the main preparation method for use (Fig. 4).

The frequency of citation (FC) for these 16 plants is also shown in Table 2. Five plants including *Alhagi camelorum*, *Rosa canina*, *Muscari neglectum*, *Fraxinus excelsior* and *Xeranthemum*

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