Ethnopharmacological survey of medicinal plants used to treat skin diseases among herbal shops in Jahrom, Iran

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Abstract

Ethnopharmacological survey of medicinal plants used to treat skin diseases among herbal shops in Jahrom, Iran.— Among the most common illnesses affecting people’s lives are skin disorders, for which a variety of therapeutic approaches has been suggested. Traditional herbal remedies can be counted among the best therapies for such diseases. Herbal shops, or “attaris” (in Persian), play a major role in the traditional therapy of each region. This study investigated the medicinal plants commonly prescribed and traded in herbal shops of Jahrom, Iran, to cure skin diseases. Ethnomedical data were collected using the snowball method for 38 plant species belonging to 34 families. A semi-structured questionnaire was used to collect information from herbal shops. Asteraceae, with five species, was the most dominant medicinal family of the prescribed plants, and the fruits, seeds, and leaves of plants are the parts most used. Herbal mask (36%) was the most common mode of herbal drug preparation. The medicinal herbs prescribed by herbal healers are often used for the treatment of acne (36%) as well as for strengthening, clarifying, and giving freshness to the skin (26%). These medicinal plants may be candidates for the development of novel herbal skincare products. The findings of this research revealed that the herbal healers of Jahrom have an outstanding knowledge of traditional treatments for skin diseases.

Key words: acne; Asteraceae; skin disease; traditional herbal medicine.

Resumen

Encuesta etnofarmacológica sobre plantas utilizadas en enfermedades de la piel en herboristerías de Jahrom, Irán.— Entre las enfermedades más comunes que afectan a la vida de las personas se encuentran los trastornos de la piel, para los que se han sugerido diversos enfoques terapéuticos. Los remedios tradicionales a base de plantas pueden contarse entre las mejores terapias para estas enfermedades. Las herboristerías, o “attaris” (en persa), juegan un papel importante en la terapia tradicional de cada región. En este estudio se inventariaron las plantas medicinales comúnmente recetadas y comercializadas en las herboristerías de Jahrom, Irán, para curar enfermedades de la piel. Los datos etnomedicinales se recogieron mediante el método de bola de nieve para 38 especies de plantas pertenecientes a 34 familias. Se utilizó un cuestionario semiestruturado para recoger información de las herboristerías. Las Asteraceae, con cinco especies, fueron la familia botánica más citada, y los frutos, semillas y hojas de las plantas fueron las partes más utilizadas. La mascarilla a base de plantas (36%) fue la forma más común de preparación. Las plantas medicinales prescritas por los curanderos se utilizan a menudo para el tratamiento del acné (36%), así como para fortalecer, aclarar y dar frescura a la piel (26%). Estas especies pueden ser candidatas para el desarrollo de nuevos productos a base de plantas para el cuidado de la piel. Los resultados de esta investigación revelaron que los curanderos de Jahrom tienen un elevado conocimiento de los tratamientos tradicionales para las enfermedades de la piel.

Palabras clave: acné; Asteraceae; enfermedades de la piel; medicina tradicional a base de plantas.
INTRODUCTION

Skin is a part of the integumentary system of the body and has a total surface area of about two square meters. Being the largest organ of the body, it serves several critical functions such as creating a protective barrier, regulating body temperature, and providing sensation among others (Gebelein, 1997). During an individual’s life from infancy to old age, various disorders and diseases may affect the skin. Several factors, including genetics, poor diet, stress, and inner emotions as well as exposure to UV radiation and airborne pollutants, may contribute to the development of skin diseases. It has been estimated that skin diseases account for approximately 34% of all diseases encountered worldwide (Śpiewak, 2000; Abbasi et al., 2010). Currently, skin diseases impose major burdens on both developed and developing countries (WHO, 2005; Afsar, 2010).

The search for natural remedies for use in skin care has received a great deal of interest from the scientific community in recent years. According to the World Health Organization (WHO), 80% of the world’s population is primarily dependent on indigenous medicine (Robinson & Zhang, 2011). About 33% of all traditional therapies are prescribed for the treatment of dermatological disorders (Annan & Houghton, 2008). Traditional medicinal resources, especially plants, play a major role in the treatment of a variety of dermatological conditions (Saikia et al., 2006). Many modern drugs and medicines have originated from ethnic herbal medicine. In recent years, a variety of herbal medicines for the treatment of skin diseases has been marketed globally. Boiron UAS, Cortizone 10®, and Kamillosan® are examples of therapeutic plant products. Other creams, gels, lotions, and ointments are produced from herbal ingredients, including Aloe vera (L.) Burn. f. leaf juice, Boswellia serrata Roxb. gum, Zingiber officinale Roscoe root extract, Calendula officinalis L. flower extract, and Matricaria L. spp. flower extract. Two creams made with a calendula base are Calendula Burn, applied for minor and moderate burns, and Calendula (Calendula L. spp.) and Borage (Borago officinalis L.), used to treat eczema. “Cortizone 10®” and “Kamillosan Salbe®” medical ointments are made with Matricaria chamomilla L. (Chamomile) extract and are commonly found in markets throughout the world.

Each ethnic culture has a traditional knowledge of plants found in the surrounding environment that are specially used to treat a variety of diseases. Indigenous people of any region, including rural residents, herbal healers, and vendors of medicinal plants, play an important role in collecting ethnobotanical data on medicinal plants. Traditional herbal shops, commonly known as “attaris” in Persian, are deeply involved in the trade and culture of each area and are thus important to ethnopharmacological studies (Mati & De Boer, 2011). Investigating herbal shops and medicinal plant stores can bring to light valuable information about the use of medicinal plants and their natural products for the treatment of various diseases. Ethnobotanical surveys on herbal shops have already been conducted in some parts of the world, including Iraq, West Africa, and Bolivia (Macía et al., 2005; Mati & De Boer, 2011; Quiroz et al., 2014).

Iran’s unique plant diversity makes it one of the world’s top ten centers of plant speciation (Noroozi et al., 2019). The exceptional plant diversity found in Iran has given rise to differing plant-based traditional remedies across the country. Indigenous people from different parts of Iran use a variety of plant species for the traditional treatment of diseases (Ghorbani, 2005; Khajoei Nasab & Khosravi, 2014). Although different ethnobotanical surveys have documented medicinal plants from several regions of Iran, no systematic investigation has been conducted on the ethnopharmacological application of medicinal plants used to treat skin diseases in the southeast of Iran. Despite the existence of numerous herbal shops in every region of the country, only a few ethnobotanical studies have been conducted in Iran with a particular emphasis on herbal shops (Amiri & Joharchi, 2013). The current research is the first to study the traditional treatment of skin diseases using plants available in herbal shops in southeastern Iran. The region is rich in plant diversity...
and has an abundance of medicinal plants; thus, indigenous people of this region have developed a substantial ethno-medical tradition. The aim of the present study was to investigate the plants and plant-based products prescribed and supplied by local herbal healers in Jahrom for the treatment of different skin conditions. Herein we report the ethnobotany of medicinal plants claimed to be effective in treating skin diseases.

**MATERIALS AND METHODS**

**Study area**

Jahrom is located 170 kilometers southeast of Shiraz, the capital of Fars Province, Iran. It is the largest city in the southern half of the province. The study area is located at 28° 30’ 00” N and 53° 33’ 38” E (Fig. 1). With

![Figure 1](image-url)

**Figure 1.** (A), map of Iran showing Fars Province; (B), Jahrom district.
a population of 14,130 inhabitants, Jahrom covers 5498 km$^2$ and is at an average altitude of 1050 m above sea level. A hot and arid climate with an average temperature around 19.5°C is dominant in this city. January (average temperature = 2°C) and July (average temperature = 40.5°C) are the coldest and hottest months of the year, respectively (Ghanbarian et al., 2011). Average annual rainfall measures about 200–500 mm. Calcareous, clay, and gypsum are the main soil types, and Jahrom’s vegetation is classified as woodland, scrubland, and subtropical annual grassland in 1,393,693 ha. Date palms, citrus, and many tropical and sub-tropical plants are grown in Jahrom, and the city’s economy is based mainly on agriculture and horticulture.

**Collecting ethnopharmacological data**

An ethnopharmacological survey of herbal shops in Jahrom city was conducted using the snowball method (Espinosa et al., 2014). A total of 21 herbal shops are located in the city, of which 16 agreed to cooperate in the current study. The aims of the present study were described to the participating herbal healers, and consent to participate was obtained from each of them according to the code of ethics of the International Society of Ethnobiology (ISE) (Hardison & Bannister, 2011). Semi-structured questionnaires were applied to systematically collect data on the treatment of skin diseases using herbal medicines (Appendix 1). Interviews were conducted in Persian with the herbal healers in their shops and included questions regarding their knowledge of various skin diseases, demographic characteristics (name, age, sex, years of experience, education), and data on medicinal plants (local names of plants, parts of plants used, methods of preparation and application of drugs). Plant specimens were identified using *Flora of Iran* (Assadi, 1988–2015) and *Flora Iranica* (Rechinger, 1965–2016), and vouchers were deposited in the herbarium of Shahid Beheshti University (HSBU).

**RESULTS AND DISCUSSION**

**Demographic information of herbal healers**

Approximately 87% of participants in this study were men; only two participants (about 13%) were women. The age of herbal healers ranged between 24–55 years with an average of 38 years. The highest level of education was a high school diploma (56%). None of the participants had an academic education in a field related to herbal medicine. Most of their knowledge had been obtained only through experience or from the legacy of past generations (68%). Only 32% of participants used traditional medicine books in addition to personal experience.

**Ethnomedicinal data**

A total of 38 species belonging to 34 genera and 23 families of medicinal plants were obtained in this study (Fig. 2; Table 1). Asteraceae (5), Fabaceae

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**Figure 2.** Some medicinal plants prescribed in skin disease by attars of Jahrom.
Ethnopharmacology of skin diseases in Jahrom, Iran

(3), and Malvaceae (3) were the most frequently used plant families, respectively (Fig. 3). Asteraceae with 23,600 species is one of the largest families of flowering plants, and most of the medicinal plants reported in many ethnopharmacological studies worldwide belong to this family (Ghorbani, 2005; Leitão et al., 2013). More than 50% of all species are annual herbs (Fig. 4), and 79% of them are native to Iran. The most used parts of plants for treating skin diseases were the fruits, seeds, and leaves (Fig. 5). Herbal mask (36%) was the most common mode of herbal drug preparation (Fig. 6). The use of an herbal mask is a simple and safe method with low complications. Because of the dust and toxic particles suspended in the air of Iran resulting from industrial pollution, exhaust fumes from automobiles, advancing deserts, and forest fires, using an herbal mask can help significantly reduce dermal complications resulting from air-borne pollutants. Medicinal herbs prescribed by herbal healers are often used for the treatment of acne (36%) as well as strengthening, clarifying, and adding freshness to the skin (26%) (Fig. 7). Acne is the 8th most common disease around the world affecting many people in their

![Figure 3](image3.png)

**Figure 3.** Medicinal plant families used for skin diseases in Jahrom region, Fars province.

![Figure 4](image4.png)

**Figure 4.** Percentage of biological forms of plants use for skin diseases in Jahrom region, Fars province.

![Figure 5](image5.png)

**Figure 5.** Plant part use of plants use for skin diseases in Jahrom region, Fars province.
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Phytochemicals of collected plants effective on the skin

Phytochemicals are chemical compounds found naturally in plants. Each plant species contains a variety of chemical compounds which, in most cases, are unique to the species. These compounds are produced and stored in different parts of the plant and can be used as pharmaceutical raw materials. Antioxidant, anticancer, and antimicrobial activities, stimulating the immune system, and affecting hormone metabolism are among some of the known properties of secondary plant compounds, which make phytochemicals suitable for preventing or treating a diverse range of diseases. Alkaloids, terpenoids, fatty acids, phenolic compounds are among the most important phytochemicals existing in medicinal plants. Interestingly, many phytochemicals which are known to contribute to the treatment of dermatological diseases and skincare were found in the plants collected in the current study (Table 1).

Figure 6. Number of plant species in each medicinal manner of use for skin diseases in Jahrom region, Fars province.

Figure 7. Number of species in each medicinal use category of plants use for skin diseases in Jahrom region, Fars province.

lifetimes (Tan & Bbate, 2015). Poor diet, hormonal changes, genetic factors, and inadequate cleansing of the skin are factors in acne. Considering the profusion of acne cases among the world’s population, the utilization of herbal medicine is a cheap but effective method to treat this condition, especially in developing countries.
## Table 1. Medicinal plants prescribed in skin disease by herbal healers of Jahrom region, Fars province.

<table>
<thead>
<tr>
<th>Family</th>
<th>Scientific name</th>
<th>Vernacular name (in Persian)</th>
<th>Application</th>
<th>Phytochemicals</th>
<th>Voucher number</th>
<th>Preparation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apiaceae</td>
<td>Foeniculum vulgare Mill.</td>
<td>Razianeh (رازیانه)</td>
<td>Strenghthen the skin, cleanser</td>
<td>Limonene (Gruenwald et al., 2000); saponins, saccharides, flavonoids (Kole et al., 2005)</td>
<td>HSBU-201513</td>
<td>Herbal incense, Pouche (fresh marigold extract mixed with oil)</td>
</tr>
<tr>
<td>Asteraceae</td>
<td>Calendula officinalis L.</td>
<td>Hamishe Bahar (همیشه بهار)</td>
<td>Treatment of eczema rashes, healing the wounds superficial skin, burns, frostbite</td>
<td>Flavonoids, saponins, carotenoids (Fotouhi et al., 2007; Ghahramani Dehbokri et al., 2010; Eslami et al., 2011; Ameri et al., 2012); mucilage (Fotouhi et al., 2007; Ghahramani Dehbokri et al., 2010; Ameri et al., 2012); calendulin (Ghahramani Dehbokri et al., 2010); triterpenoids (Bedi &amp; Shenefelt, 2002); sterols (Ameri et al., 2012); tannins (Ghahramani Dehbokri et al., 2010); vitamin E (Ameri et al., 2012); esterase, antioxidant (Nasiri et al., 2013)</td>
<td>HSBU-201514</td>
<td>Poultice (fresh marigold extract mixed with oil)</td>
</tr>
<tr>
<td>Asteraceae</td>
<td>Cichorium intybus L.</td>
<td>Kasni (کاسنی)</td>
<td>Treatment of pimples and melasma caused by liver</td>
<td>Inoline (Nasiri et al., 2013); essential oil, mucilage, tannins, minerals, mangenese, alkaloids, carvacrol (Bedi &amp; Shenefelt, 2002); sesquiterpenes, flavonoids, lactones, cinnamic acid (Gruenwald et al., 2000); sesquiterpenes, lactones (Kole et al., 2006)</td>
<td>HSBU-201515</td>
<td>Aromatic water, orally (the raw leaf)</td>
</tr>
<tr>
<td>Asteraceae</td>
<td>Matricaria aurea (Loefl.) Sch. Bip.</td>
<td>Babooneh (بابونه)</td>
<td>Eczema and acne treatment, anti-swelling and redness of the skin, wound healing, Strengthens the skin, Constrictor skin pores, melasma, removing the boil</td>
<td>Chamazulene (Kraft, 2007; Malaki et al., 2007); inositol, flavonoids (Malaki et al., 2007); saponins, bisabolol (Kraft, 2007)</td>
<td>HSBU-201516</td>
<td>Herbal incense, herbal mask, herbal mask (treatment of boils)</td>
</tr>
<tr>
<td>Asteraceae</td>
<td>Matricaria chamomilla L.</td>
<td>Babooneh (بابونه)</td>
<td>Eczema and acne treatment, anti-swelling and redness of the skin, wound healing, Strengthens the skin, Constrictor skin pores, melasma, removing the boil</td>
<td>Chamazulene (Kraft, 2007; Malaki et al., 2007); inositol, flavonoids (Malaki et al., 2007); saponins, bisabolol (Kraft, 2007)</td>
<td>HSBU-201517</td>
<td>Herbal incense, herbal mask (treatment of boils)</td>
</tr>
<tr>
<td>Asteraceae</td>
<td>Silybum marianum (L.) Gaertn.</td>
<td>Khar-e Maryam (خارمریم)</td>
<td>Improvements and fixes of pimples, boils and wounds</td>
<td>Silymarin (Yaghmaei et al., 2011; Madani et al., 2007); flavonoids, bisabolol (Wagner et al., 1986; Safahyi et al., 1994); choline (Bedi &amp; Shenefelt, 2002); steers, flavonoids (Wagner et al., 2003)</td>
<td>HSBU-201518</td>
<td>Orally, herbal mask</td>
</tr>
<tr>
<td>Asteraceae</td>
<td>Silybum marianum (L.) Gaertn.</td>
<td>Khar-e Maryam (خارمریم)</td>
<td>Improvements and fixes of pimples, boils and wounds</td>
<td>Silymarin (Yaghmaei et al., 2011; Madani et al., 2007); flavonoids, bisabolol (Wagner et al., 1986; Safahyi et al., 1994); choline (Bedi &amp; Shenefelt, 2002); steers, flavonoids (Wagner et al., 2003)</td>
<td>HSBU-201518</td>
<td>Orally, herbal mask</td>
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<td>Family</td>
<td>Scientific name</td>
<td>Vernacular name (in Persian)</td>
<td>Application</td>
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<tr>
<td>Boraginaceae</td>
<td>Borago officinalis L.</td>
<td>Gole Gavzaban (گل گاوزبان)</td>
<td>Fixes the acne caused by stress</td>
<td>Herbal tea</td>
<td>Flower</td>
<td>HSBU-201519</td>
</tr>
<tr>
<td>Boraginaceae</td>
<td>Echium amoenum Fisch. &amp; C. A. Mey.</td>
<td>Gole Gavzaban (گل گاوزبان)</td>
<td>Fixes the acne caused by stress</td>
<td>Herbal tea</td>
<td>Flower</td>
<td>HSBU-201520</td>
</tr>
<tr>
<td>Brassicaceae</td>
<td>Descurainia sophia (L.) Web ex Prantl</td>
<td>Khakehir (خاکشیر)</td>
<td>Strengthen the skin</td>
<td>Orally, herbal mask</td>
<td>Seed</td>
<td>HSBU-201521</td>
</tr>
<tr>
<td>Cucurbitaceae</td>
<td>Cucumis sativus L.</td>
<td>Khiyar (خیار)</td>
<td>Acne fixes, sunburn cure, skin refreshing</td>
<td>Herbal mask</td>
<td>Fruit</td>
<td>HSBU-201522</td>
</tr>
<tr>
<td>Fabaceae</td>
<td>Glycyrrhiza glabra L.</td>
<td>Shirin Bayan, Mahk (شیرین بیان مهک)</td>
<td>Acne fixes, strengthens the skin, skin refreshing</td>
<td>Herbal mask</td>
<td>Rhizome</td>
<td>HSBU-201523</td>
</tr>
<tr>
<td>Fabaceae</td>
<td>Trigonella foenum-graecum L.</td>
<td>Shanbalileh (شنبلیله)</td>
<td>Fungal skin therapy, strengthen the skin, healing the wounds, abrasions, sunburn and burns</td>
<td>Herbal mask (fenugreek seed powder with milk or yoghurt)</td>
<td>Seed</td>
<td>HSBU-201524</td>
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<tr>
<td>Fabaceae</td>
<td>Senna alexandrina Mill.</td>
<td>Barg-e Sana (برگ سنا)</td>
<td>Treatment of blackheads, pimples and skin rashes</td>
<td>Herbal incense</td>
<td>Leaf</td>
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<tr>
<td>Family</td>
<td>Scientific name</td>
<td>Vernacular name (in Persian)</td>
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<td>Parts used</td>
<td>Voucher number</td>
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<tr>
<td>Lamiaceae</td>
<td><em>Zataria</em> multiflora Boiss.</td>
<td>Abshen (آبشن)</td>
<td>Elimination of the effects of insect bites on the skin, skin refreshing</td>
<td>Herbal incense</td>
<td>Leaf and flower</td>
<td>HSBU-201526</td>
</tr>
<tr>
<td>Lythraceae</td>
<td><em>Punica</em> granatum L.</td>
<td>Golnar (گلنار)</td>
<td>Fixes acne and freckles</td>
<td>Herbal mask</td>
<td>Flower</td>
<td>HSBU-201527</td>
</tr>
<tr>
<td>Lythraceae</td>
<td><em>Lawsonia</em> inermis L.</td>
<td>Hana (حنا)</td>
<td>Acne fixes</td>
<td>Herbal mask (Famaria spp. powder mixed with henna)</td>
<td>Leaf</td>
<td>HSBU-201528</td>
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<tr>
<td>Malvaceae</td>
<td><em>Alcea</em> rosea L.</td>
<td>Khatmi-e Sefid (ختمی سفید)</td>
<td>Skin refreshing, eliminating acne and boils</td>
<td>Herbal incense</td>
<td>Flower and fruit</td>
<td>HSBU-201529</td>
</tr>
<tr>
<td>Family</td>
<td>Scientific name</td>
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<td>Application</td>
<td>Preparation</td>
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<tr>
<td>Malvaceae</td>
<td>Malva neglecta</td>
<td>Panirak (پنیرک)</td>
<td>Acne fixes</td>
<td>Herbal incense, orally</td>
<td>Leaf, Fruit</td>
<td>HSBU-201530</td>
</tr>
<tr>
<td>Malvaceae</td>
<td>Malva sylvestris</td>
<td>Khatmi,Gol-e Panirak (ختمی، گل پنیرک)</td>
<td>Acne fixes, skin clarity</td>
<td>Herbal incense, orally</td>
<td>Flower</td>
<td>HSBU-201531</td>
</tr>
<tr>
<td>Moraceae</td>
<td>Ficus carica L.</td>
<td>Anjir (ویر)</td>
<td>Acne fixes, skin clarity</td>
<td>Soap (Matricaria spp. &amp; figs &amp; oil snail)</td>
<td>Fruit</td>
<td>HSBU-201532</td>
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<td>Oleaceae</td>
<td>Olea europaea L.</td>
<td>Zeytoon (زیتون)</td>
<td>Treatment of melasma</td>
<td>Herbal mask (olive oil, egg yolk)</td>
<td>Fruit</td>
<td>HSBU-201533</td>
</tr>
<tr>
<td>Papaveraceae</td>
<td>Fumaria parviflora Lam.</td>
<td>Shahtareh (شاهرخ)</td>
<td>Treatment of melasma and acne</td>
<td>Orally, aromatic water, powder</td>
<td>The aerial parts of the plant</td>
<td>HSBU-201534</td>
</tr>
<tr>
<td>Papilionaceae</td>
<td>Alfag porsaram</td>
<td>Toranjabin (تورنجبان)</td>
<td>Strengthen the skin</td>
<td>Orally</td>
<td>The aerial parts of the plant</td>
<td>HSBU-201535</td>
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<td>Platanaceae</td>
<td>Platanus orientalis L.</td>
<td>Chenar (چنار)</td>
<td>Treatment of melasma and acne</td>
<td>Aromatic water</td>
<td>Leaf</td>
<td>HSBU-201536</td>
</tr>
</tbody>
</table>
### Table 1. Medicinal plants prescribed in skin disease by herbal healers of Jahrom region, Fars province. (cont.)

<table>
<thead>
<tr>
<th>Family</th>
<th>Scientific name</th>
<th>Vernacular name (in Persian)</th>
<th>Application</th>
<th>Preparation</th>
<th>Parts used</th>
<th>Voucher number</th>
<th>Phytochemicals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poaceae</td>
<td><em>Triticum aestivum</em> L.</td>
<td>Javaneh gandom (جوانه گندم)</td>
<td>Treatment of acne, skin clarity</td>
<td>Herbal mask</td>
<td>Seed, root and radicle</td>
<td>HSBU-201536</td>
<td>Vitamin A and vitamin E, antioxidant, carotene A (Kapoor &amp; Saraf, 2010); mucilage, soluble silicic acid (Gruenwald et al., 2000); vitamin E, gliadin and glutenin (Kole et al., 2005)</td>
</tr>
<tr>
<td>Polygonaceae</td>
<td><em>Rheum ribes</em> L.</td>
<td>Rivas (ریواس)</td>
<td>Treatment of blackheads</td>
<td>Herbal mask (rhubarb extract &amp; honey)</td>
<td>Flower</td>
<td>HSBU-201537</td>
<td>Flavonoids, vitamin A, vitamin B, and vitamin C, chrysophanol, phycin, rhein, alo-emodin, phycin-8-O-glucoside, alo-emodin-8-O-glucoside, sennoside A and rhaponticin (Sayyah et al., 2009)</td>
</tr>
<tr>
<td>Ranunculaceae</td>
<td><em>Nigella sativa</em> L.</td>
<td>Siyah daneh (سیاهدانه)</td>
<td>Treatment of blackheads, skin clarity</td>
<td>Herbal mask (<em>N. sativa</em> &amp; vinegar)</td>
<td>Seed</td>
<td>HSBU-201538</td>
<td>Amino acids, mucilage, alkaloids (e.g. <em>nigelleine</em>), organic acids, tannins, resins, saponins, minerals, ascorbic acid, folic acid, fatty acids (e.g. oleic acid and linoleic acid), terpenoids, volatile oil, thymol, thymoquinone (Atta-ur-Rahman et al., 1985, 1992, 1995; Memenos et al., 1986; Duke, 1992; Al-Gaby, 1998; Takruri &amp; Dahe, 1998; Ramadan &amp; Moersal, 2003)</td>
</tr>
<tr>
<td>Rhamnaceae</td>
<td><em>Ziziphus spina-christi</em> (L.) Willd.</td>
<td>Sedr (سدر)</td>
<td>Treatment of acne</td>
<td>Herbal mask (leaf powder of <em>Z. spina-christi</em> &amp; lemon juice)</td>
<td>Leaf</td>
<td>HSBU-201539</td>
<td>Flavonoids, comphen (Maleki et al., 2007); saponins (Nasiri et al., 2013); flavonoids, saponins, fatty acid, mineral, vitamins, iron, sodium, zinc and copper, alkaloids, triterpenoids, tannins, polysaccharides (Ahmad Kaleem et al., 2014)</td>
</tr>
<tr>
<td>Rhamnaceae</td>
<td><em>Ziziphus jujuba</em> Müll.</td>
<td>Annab (عباب)</td>
<td>Treatment of acne</td>
<td>Orally</td>
<td>Fruit</td>
<td>HSBU-201540</td>
<td>Saponins (Nasiri et al., 2013); flavonoids, alkaloids, triterpenoids, saponins, tannins, vitamin C (Han et al., 1989; Sakhi Sarmaghi, 2010; Ahmad Kaleem et al., 2014); fatty acid, mineral, polysaccharides (Ahmad Kaleem et al., 2014); triterpenes, mucilage, proteins (Sakhi Sarmaghi, 2010; Han et al., 1989)</td>
</tr>
<tr>
<td>Rosaceae</td>
<td><em>Prunus dulcis</em> (Mill.) D. A. Webb</td>
<td>Badham (بادم)</td>
<td>Treatment of blackheads, skin clarity</td>
<td>Herbal mask (bitter almond oil &amp; lemon juice &amp; <em>Marxaria spp.</em>), almond oil</td>
<td>Seed</td>
<td>HSBU-201541</td>
<td>Oleic acid, linoleic acid, mucilage (Gruenwald et al., 2000)</td>
</tr>
<tr>
<td>Rosaceae</td>
<td><em>Rosa damascena</em> Herrm.</td>
<td>Gol-e Sorkh (گل سرخ)</td>
<td>Skin clarity</td>
<td>Vegetable oil</td>
<td>Flower</td>
<td>HSBU-201542</td>
<td>Terpenes, glycosides, flavonoids, anthocyanin, vitamin C, tannins, fatty oil and organic acids, phenolic compounds, essential oil, 1-ascorbic acid, quercetin-3-O-glucoside, kaempferol-3-O-rhamnoside, kaempferol-3-0-arabinoside ( Boskabady et al., 2011)</td>
</tr>
</tbody>
</table>
### Table 1. Medicinal plants prescribed in skin disease by herbal healers of Jahrom region, Fars province. (cont.)

<table>
<thead>
<tr>
<th>Family</th>
<th>Scientific name</th>
<th>Vernacular name (in Persian)</th>
<th>Preparation</th>
<th>Parts used</th>
<th>Phytochemicals</th>
<th>Flavonoids</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salicaceae</td>
<td>Salix alba L.</td>
<td>بید (ز.ا. ل.)</td>
<td>Treatment of acne and keloids</td>
<td>Stem</td>
<td>Flavonoids (Gruenwald et al., 2000). Anthocyanins,</td>
<td></td>
</tr>
<tr>
<td>Urticaceae</td>
<td>Urtica dioica</td>
<td>بید (ز.د.)</td>
<td>Fresh vegetable oil</td>
<td>Leaf</td>
<td>Flavonoids, rutin, vitmin C.</td>
<td></td>
</tr>
<tr>
<td>Xanthorrhoeaceae</td>
<td>Xanthorrhoea australis</td>
<td>زاره (ز.آ.)</td>
<td>Fresh, skin refreshing</td>
<td>Leaf</td>
<td>Flavonoids, rutin, vitmin C.</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- Phospholipids, fatty acids, vitamins, minerals, phenols, saponins, glycosides.
- Phospholipids, fatty acids, vitamins, minerals, phenols, saponins, glycosides.
- Phospholipids, fatty acids, vitamins, minerals, phenols, saponins, glycosides.
- Phospholipids, fatty acids, vitamins, minerals, phenols, saponins, glycosides.
Electronic databases including Google Scholar, PubMed, and Web of Science were searched for the scientific names of all species and the keywords “chemical profiling” and “pharmacological properties”. An extensive number of studies published in various journals was collected, including research reports, review articles, book chapters, and books. The literature was divided into different sections based on the title and abstract, and all non-relevant and duplicate articles were removed. Finally, some of the newest articles with a comprehensive amount of information were selected.

Comparing the results of the present study with those of previous works on phytochemicals revealed that herbal medicines prescribed by herbal healers in the Jahrom region comprise the most efficient and suitable natural compounds for the treatment of skin diseases. For example, tannins, which have astringent properties and cause the coagulation of albumin, are found in *Lawsonia inermis* (henna) and *Ziziphus spina-christi* (L.) Willd., both of which are rich in tannins and are suitable herbal remedies for the treatment of acne (Maleki et al., 2007). The skin softening properties of saponins, mucilage, and salicylic acid which are abundant in the *Viola* L. species make this species a great candidate for remedies to soften and refresh skin (Bedi & Shenefelt, 2002). Amino acids, with their great water holding capacity, can promote freshness in skin and represent an effective treatment for dry skin (e.g. in *Aloe vera*; Maleki et al., 2007). Fumaric acid found in *Fumaria* L. is effective in curing skin disorders (Khalighi Sigaroodi et al., 2005). Wheat germ (the flour of embryos of wheat grains) is rich in vitamins A and E as well as antioxidants and can be considered a potent softening and moisturizing agent for skincare (Bakhhtiari & Radan, 2013). Moreover, vitamin A is a rejuvenating and anti-aging agent which stimulates the formation of new cells and helps reduce wrinkling (Gediya et al., 2011). In *Matricaria chamomilla* (chamomile), linoleic and oleic fatty acids and chamazulene improve the process of wound healing and water retention in the horny layer of the skin (Maleki et al., 2007).

**Medicinal plants for skin treatment in other parts of Iran and the world**

Some of the plant species presented in the current study, such as *Trigonella foenum-graecum* L., *Lawsonia inermis*, *Olea europaea* Wall. & G. Don, *Nigella sativa* L., *Urtica dioica* L., and *Aloe vera*, are also used in other parts of Iran and the world to treat skin disease (Malik et al., 2019; Nambejja et al., 2019; Sinkar & Samarth, 2019; Tsioutsiou et al., 2019). Similar to the indigenous people of Jahrom, the locals of Central Macedonia and Greece use *Matricaria chamomilla*, for wound healing (Ghafari et al., 2017; Tsioutsiou et al., 2019). *Silybum marianum* (L.) Gaertn., *Alcea rosea* L., *Malva sylvestris* L., *Rosa × damascena* Herrm., *Urtica dioica*, *Cucumis sativus* L., *Ficus carica*, and *Trigonella foenum-graecum* are used globally for the treatment of hyperpigmentation (Ghafari et al., 2017). *Trigonella foenum-graecum* is used in Jahrom and northern Pakistan to treat wounds (Malik et al., 2019). *Cucumis sativus* in Katabi, Uganda (Nambejja et al., 2019) and *Calendula officinalis*, in the Warud region of Maharashtra, India (Sinkar & Samarth, 2019) are used to treat different skin diseases. *Cichorium intybus* L. is used traditionally by the indigenous people of Urmia, Iran, for head itching (Baharvand-Ahmadi et al., 2015). The indigenous people of Jahrom and Chogharzai Valley (in Pakistan) use *C. officinalis* to treat skin diseases (Sheri et al., 2011). *Punica granatum* L. and *C. sativus* have the same therapeutic use for the treatment of skin disorders in Jahrom and the northwest Frontier Province of Pakistan (Abbasi et al., 2010). *Senna alexandrina* Mill. is used to treat pimples in Jahrom and northwest Punjab, Pakistan (Gul et al., 2012). *Descurainia sophia* (L.) Webb ex Prantl and *L. inermis* (henna) are used as traditional herbal medicines in Jahrom and in the Saravan region of Iran (Sadeghi et al., 2014). *Malva sylvestris* is a common medicinal plant for the treatment of skin diseases in Sirjan, Saravan, and Jahrom (Khajoei Nasab & Khosravi, 2014; Sadeghi et al., 2014). *Fumaria parviflora* Lam. has the same therapeutic use on the skin in the Hormozgan province of Iran as it does in Jahrom (Safa et al., 2013).

**CONCLUSIONS**

Documentation of traditional medical practices is of a great importance for the preservation the knowledge and possible new drug discoveries. The purpose of the present study was to assess and document the knowledge of herbal healers in the
traditional treatment of skin diseases and ensure the accuracy of traditional herbal remedies recommended by these therapists. This study was the first documentation of herbal medicines prescribed for skin care in southeastern Iran. The results demonstrated that the use of traditional medicinal plants for skin care is still prevalent in this region. Diverse plant-based remedies are prescribed by local herbal shops and healers for the treatment of a variety of skin-related conditions. By reviewing previously published literature on the phytochemical composition of plants included in the present research, it can be concluded that the herbal medicines are being prescribed accurately for the treatment of skin diseases. Further exploration of the phytochemicals of these medicinal plants may lead to the discovery of novel skincare products.

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Appendix 1. Semi-structured questionnaire used in the interviews, in English and the original Persian versions

(In English)

Ethnopharmacological survey of medicinal plants use for the treatment of skin diseases among the herbal shops of Jahrom, southeast of Iran

Satisfaction of the interviewees to participate in the study:

I ................................................. .... (Name of the interviewee) hereby give my full consent and knowingly agree to participate in this study.

Date ........................................ (Signature/finger of the interviewee).

Details of informants (interviewees):

Number of questionnaire:

1. Name ...............................................................
2. Gender ............................................................
3. Age ..................................................................
4. Education level ..................................................
5. Herbal shop address ..........................................
6. Phone number ..................................................

Information about herbs and their use in the treatment of skin diseases:

The questions in the interview:

Are herbs useful in treating skin diseases in this region?

How many plants do you know that are effective in treating skin diseases?

# herb 1

1- What is the local name of this plant?
2- What skin diseases is it used to treat? (Acne, melasma, eczema, etc.)
3- Which part of the plant do you use?
4-Describe how you prepared the treatment? (decoction, herbal mask, infusion, etc.)
5-Is this plant used in combination with another species? If yes, which plants?
نظرسنجی اتنوفارماکولوژیکی گیاهان دارویی مورد استفاده در درمان بیماری‌های پوستی در عطاریهای جهرم، جنوب شرقی ایران

رضایت مصاحبه‌شونده‌گان برای شرکت در این مطالعه:

اینجانب، این مطالعه بدينويله رضايت كامل مي دهم و آگاهانه براي شرکت در اين مطالعه موافقتم. امضاء و/or انگشت رضايت 

تاريخ ........................................................................................................ (امضاء/انگشت از مصاحبه‌شونده)

اطلاعات مخبران (مصاحبه‌شونده‌گان):

شماره پرسشنامه: ...........................................

نام...........................................................................................

2. جنسیت .............................................................................................

3. سن............................................................................................... 

4. سطح تحصیلات ................................................................................. 

5. آدرس عطاری .................................................................................... 

6. شماره تلفن..................................................................................

اطلاعات در مورد گیاهان دارویی و استفاده از آنها در درمان بیماری‌های پوستی:

سوالات مصاحبه:

آیا گیاهان دارویی در درمان بیماری‌های پوستی در این منطقه مفید هستند؟

چند گیاه می‌شناسید که در درمان بیماری‌های پوستی موثر باشند؟

1. گیاه #

1- نام محلی این گیاه چيست؟

2- برای درمان چه بیماری‌های پوستی استفاده می‌شود؟ (آگنه، ملاسمه، اژکزما و غیره)

3- از کدام قسمت گیاه استفاده می‌گردد؟

4- نحوه تهیه درمان را توضیح دهید؟ (جوشانده، ماسک گیاهی، دم کرده و ...)

5- آیا این گیاه در تركیب با گونه دیگر استفاده می‌شود؟ اگر بله، کدام گیاهان؟