A review of the medical uses of medicinal plants including Myrtus communis linn, persicum Heracleum and Aloysia citrodora

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Abstract: Nowadays, the studies are focused on using massive trove of traditional medicines with historical and proved antiquity in treatment of types of diseases. According to limitations of using antibiotics, trend for replacing them with natural and low cost materials is increased. Among different alternative materials, products with plant origin have gained special position recently. Therefore, due to drug treatment methods of traditional medicine of Iran, it seems necessary to find therapeutic uses of Medicinal Plants to treat the diseases. Among the Medicinal Plants, one can refer to 3 plants including Myrtus communis linn, persicum Heracleum and Aloysia citrodora. Myrtle is an evergreen plant and the medicinal part of this plant is in leaves. The healing properties of myrtle include using it in positional form to treat herpes, as an antiseptic and to treat inflammation of the nasal mucosa. Lemon verbena is also a light green plant and the applicable part of this plant is in leaves and flowers are used as tea and sweetener and the essences of leaves are used to produce perfumes. Persian hogweed is also an aromatic plant and it has been used since last times to make food flavored. This plant has abundant advantages such as strong antibacterial and antiseptic properties. In this study, some medical uses of the three plants are investigated.

Key words: medicinal plants, Myrtus communis linn, persicum Heracleum, Aloysia citrodora

Introduction

Medicinal plants

Medicinal plants have special value and importance in supplying health of the societies in terms of medication and prevention of diseases. This part of natural resources has an antiquity equal to human history and has been one of the most important sources for food and medicine supply of human over the generations. From historical viewpoint, plans have been very important in development of human societies and wide range studies have been conducted to find the products and natural materials of medicinal plants over the history; although the important issue is that only less than 10% of a total of 250 thousands herbal species of the world have been used for more than one biological function. In other words, according to the published statistics by the World Health Organization (WHO), only 35-70 thousands medicinal plants have been used at least for one or more times over the time. Medicinal plants are reservoirs rich in secondary metabolites and fundamental and effective sources of many medicinal substances and one or some of their organs contain the effective substance. The substance that forms less than 1% of plant dry weights has effective medicinal properties for living things [16]. Currently, 25% of existing medicines have herbal origin and 12% of medicines are made of microbial sources. The potential of production of plant herbal medicines in nature is very high. For example, it is said that 125000 species of medicinal plants could be found in the world's tropical forests. Economic and commercial value of medicinal plants is very high. In some statistics, value of world trade of medicinal plants is estimated more than 43 billion dollars per year and according to the statistics published in internet, sale of plant products in 1997 has been more than 24.3 billion U.S dollars.

Public trend to use medicines and herbal medication and natural products has been increased, especially over the years and the most important reason for this has been proving destructive effects and side effects of chemical medicines on one hand and environmental pollutions threatening the earth on the other hand. Moreover, medicinal plants are the natural resources and many countries have such resources more and less. The type, number and diversity of plant species vary based on geographical condition and location of each region. In Iran, about 8000 plant species are grown and most of them could have medicinal properties. Lots of medicinal plants grow in wild and natural form in the plains and mountain slopes and special habitats [5]. Botanist doctors advise herbal medicine for all types of disease. Herbal medicines are milder than chemical medicines and their effect is also slow. Moreover, they have milder side effects than chemical medicines. Optimal, logical and proper use of these resources as cost-effective resources in terms of technology and simpler than chemical pharmaceutical Industries could supply a part of main health and medical needs of the society in addition to prevent exit of large amount of exchange and prevent expansion of dependence of the strangers and foreign countries. Therefore, through making appropriate policies and strategies and based on a realistic recognition of existing status of
these resources and using academic methods in all dimensions including planting, harvesting and economic and industrial utilization, whether from the nature or mechanized cultivation, a real and fundamental understanding could be obtained about the role and efficiency of medicinal plants at the developing societies like Iran. Through this, in addition to protect these national capitals, sustainable development and prosperity of the society could be also achieved.

**Persian hogweed**

Persian hogweed is a flowering plant from Apiaceae strain with scientific name ”Heracleum persicum” and is one of the local plants of Iran that is grown in humid montanous regions of Iran. The plant has 6 species with thick, straight, cylindrical, grooved and slightly shaggy stems and its height reaches to 75-150cm [11]. Its leaf is like cabbage leaves, but larger and its flowers is white Apiaceous. When its fruit is grown, it is white, rounded and similar to coin and is very fragrant (figure 1). Eating the stem and leaves of the Heracleum persicum as additive and spice with food or adding them to pickles is useful and can prevent corruption of the pickles. Heracleum persicum has warm nature and is an aromatic plant and is being used as spice in foods since last times. This plant can make the food soft and can change the bad breath [3]. Chemicals in Heracleum persicum include Hecilic acetate, astilic acetate, ethyl butyrate and other various acids causing its sharp smell [11].

![Figure 1: Heracleum persicum](image)

Hexyl butyrate (56.5%), Acetyl acetate (16.5%), Hexyl 2-Butyrate (5.2%) and Hexyl isobutyrate (3.4%) are the components of the essential oil of this plant [12]. Because of presence of these materials, antioxidant, anticonvulsant, antimicrobial, antifungal activities and immune system of this plant are reported. Hydroalcohol extract and essential oil of this plant have shown painkilling and anti-inflammation effects and these results support traditional use of this plant in reduction of pain and inflammation [12].

**Medicinal properties of Heracleum persicum**

Medicinal properties observed in Heracleum persicum could be because of Alkaloids, terpenoids and Triterpenes in the plant [13]. From pharmaceutical perspective, it can strengthen the stomach and gastrointestinal tract and dispose the toxins, it is carminative and plays key role in meeting indigestion and can strengthen the digestion and appetite. Heracleum persicum can reduce harms of heavy foods and toxic medicines and is useful for the patients with Jaundice, edema, hiccup, and difficult urinating [3]. This plant has strong disinfectant and germicidal effects [6]. The plant is anticonvulsants, anti-worm and insecticidal [3]. Estonia extracts of seeds of the plant could be considered as efficient anticonvulsants [13]. The root of this plant is stronger than other parts of it and they are useful to use on the inflammations. Eating the plant can strength the mind and memory and remove stupidity and is useful for Paralysis and numbness of body organs [3]. Some terpene compounds in this plant such as eugenol -cineol and linalool have anesthetics matter, relaxants (sedatives) of muscle and inhibitory effect on motion. Hence, the terpene compounds in the seeds may be the impact factor of this plant [10]. The authorized amount of feed of Heracleum persicum powder is to 4gr. Overuse of Heracleum persicum can cause abortion. Hence, pregnant women can't use it in large amount.

**Myrtle**

Myrtle is a plant of Myrtaceae strain and is known as scientific name ”Myrtus communis linn” and has long historical antiquity and has also special position in medicinal manuscripts remained from Hippocrates, Pedanius Dioscorides, Galen and Islamic scholars. The myrtle plant is an evergreen pomegranate –like shrub and with root, stem, leaves, blossoms, fruit and something on stem in same color of stem similar to palm called “banak” [1]. Today, these bumps are called as scabies [9]. Because of having evergreen leaves and beautiful and big flowers, myrtle is used also as ornamental plant [1]. Myrtus communis linn has white, nice and unique flowers appeared in summer (figure 2). In Islamic
narratives, myrtle flower is called as the best flowers [9]. This plant is known as "A'as" in Iranian medication proses and its fruit is called "Hab Al-A'as" [7]. Nature of myrtle is considered usually cold at the first degree and dry in second degree [4]. The dried leaves of this plant contain compounds including terpinolene, cineole, linalool, terpineol, linalyl acetate, tannin and flavonoid [15].

Figure 2: Myrtus communis linn

Medical properties of Myrtus communis linn
Myrtus communis linn is aromatic and fragrant plant and this is because of existence of glands containing essential oils in the leaves, fruit and flowers [15]. Since ancient times, the extract of this plant has been used as disinfectant substance. In addition to disinfectant effect, the extract of this plant could be used for edible uses and external use as a strengthening matter for stomach and astringent and also to meet respiratory diseases and urinary tract [5]. The wood of myrtle is also aromatic and could be used in woodcarving. Usable parts of the tree include leaves, fruit and the bumps on its stem. Leaves of the three are evergreen and have also medicinal uses and have been used since last times as a disinfectant medicine. The leaf incense of myrtle is the best medicine for disinfecting the respiratory tract. The leaves and fruit of the plant are bitter and contain Gallic acid and plentiful essential oil. In the bumps on the stem, plenty of Gallic acid is existed and its medical properties are more than other parts. The fruit and the bumps on the stem can strengthen the stomach and are astringent and anti-hemorrhage because of containing Gallic acid. Eating the fruit and paste of the myrtle is useful to prevent cough and pulmonary hemorrhage and pulmonary pain. The roots, leaves and seeds of this plant are useful to strengthen hairs and preventing hair loss and can also prevent hair graying [3]. Decoction of myrtle is useful for toothache and to disinfect the throat and mouth. Its extract could also strengthen the gum and is also useful in meeting toothache and slurred speech caused by weakness of tongue muscles [7]. The authorized feed of myrtle seeds is 5gr and indulging in smelling it can cause insomnia.

Myrtle is native of South Europe, North Africa and West Asia and has been also extended to South America, Northwest Himalaya and Australia and could be found vastly in Mediterranean region [14]. It is also available in Iran and could be found in provinces including Gilan, Kermanshah, Khuzestan, Kerman, Fars, Hormozgan, Sistan and Baluchistan, Khorasan, Yazd, Chahar Mahal va Bakhtiari and Lorestan [15]. The shrub is native of south and north of Iran and could be found everywhere that olive and eucalyptus is existed [2].

Lemon verbena
Lemon verbena with scientific name "Aloysia citriodora" is a falling shrub from the verbenaceae strain and its height reaches to 3-5m. The synonyms of this plant include citriodora, Verbena triphylla, Verbena citriodora and Lippia triphylla.

The leaves of Aloysia citriodora are stretched, simple and speared with 7-10cm in length, with tip and pale green color and are placed on the stem in form of triple bunches. The stems are long, angled and branched. Its flowers are small and including a cup that is white from outside and is bluish purple from inside (figure 3). The set of its flowers has a pyramid form around a long axis. Its calyx is tubular and ends in 4 thin teeth and its corolla is composed of 4 wide lobes. It has 4 flower flags, which are equal two by two. Its fruit is like shaft and contains two grains and 21 seeds [8].
The main compounds identified in leaves of Aloysia citrodora are as follows:
Limonene, cineole, geranial, neral, spathulenol, caryophyllene oxide
The main compounds in its flower are:
Limonene, cineole, geranial, neral, spathulenol, caryophyllene oxide, neryl acetate

Aloysia citrodora is native of South America and is naturally grown in Chile, Peru and Argentina. The Aloysia citrodora is existed in wide range in majority of Warm and temperate regions such as Mediterranean region, Europe. This plant is being planted current in north of Iran. Aloysia citrodora needs warm weather and plentiful light and high humidity for its growth and is sensitive to cold weather. It needs light soil for its growth and adequate pH of soil for this plant is given to 5.6. In fact, it needs sunny and temperate climate without severe winds.

Medical properties and used of Aloysia citrodora
Aloysia citrodora is grown in different regions of Iran and its leaves and flowering branches have medicinal effects. Leaves of this herb have properties such as antipyretic, analgesic, carminative, aid digestion, relaxing, relieve abdominal pain, nausea, heart palpitations fixes and tonic effect on the stomach and can also reducing neuralgia and the body temperature in diseases. Aloysia citrodora is also useful to treat indigestion, bloating, unilateral headaches, nerve pain, dizziness and fix hear the voice, the body, relieve fatigue and symptoms of the common cold. Moreover, it could be used at home as spice. The extract of Aloysia citrodora has bactericidal and insecticide properties and could be also used to produce perfumes. Essential oil of this plant could be also used in food industries and in perfume industry abundantly. Aloysia citrodora tea is extremely soothing and comforting the nerve. Aloysia citrodora is one of the plants growing in aromatic gardens of European Countries in large amount. The plant is in rank of the best medicines to strengthen the stomach. For this purpose, it would be better to use it like tea [8]. The leaves and young flowering branches and the flowers of this plant are used in traditional medication. As the volatile extracts rich in terpenoid compounds are stimulant, they may stimulate kidney while disposal. In patients with kidney failure and during pregnancy and breast-feeding, overuse of this plant should be avoided. Positional use of the essential oil may cause skin allergy. To strengthen the memory, its extract could be used and the leaves and essence of the plant should be maintained out of rich of light in cold space and in closed dished. The existing products of Aloysia citrodora in the market include Veron Tea [8].
Table 1: summary of some researches in field of antimicrobial properties of medicinal plants including Myrtus communis linn, persicum Heracleum and Aloysia citrodora

<table>
<thead>
<tr>
<th>Plant</th>
<th>Author</th>
<th>Year</th>
<th>Title</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>persicum Heracleum</td>
<td>Shafiei et al</td>
<td>2014</td>
<td>Analysis of antimicrobial properties of persicum Heracleum during storage mayonnaise</td>
<td>persicum Heracleum extract shows inhibitory properties against bacteria such as Escherichia coli, Salmonella and lactic acid bacteria</td>
</tr>
<tr>
<td>Myrtus communis linn</td>
<td>Shahbazi and Karami</td>
<td>2014</td>
<td>Study of antimicrobial activity of Myrtus communis linn extract against Staphylococcus aureus, Pseudomonas aeruginosa, Escherichia coli and Klebsiella pneumoniae</td>
<td>Concentration of 80mg/l of the plant extract showed significant effect on Staphylococcus aureus and Klebsiella pneumonia. The extract showed no effect on Pseudomonas aeruginosa and only the concentration of 80mg/l showed effect on E-Coli.</td>
</tr>
<tr>
<td>Myrtus communis linn</td>
<td>Saiedi et al</td>
<td>2012</td>
<td>Analyzing antimicrobial activity of Myrtus communis linn extract and plant against Staphylococcus aureus and resistant to selective antibiotics</td>
<td>The results obtained from this study showed that minimum inhibitory concentration of the plant extract is in concentration of 5mg/ml.</td>
</tr>
<tr>
<td>Aloysia citrodora</td>
<td>Nasiri et al</td>
<td>2013</td>
<td>Studying phenyl compounds, free radical control ability and inhibitory effect of Myrtus communis linn on polyphenol oxidase enzyme extracted from Litopenaeus vannamei frame shrimp</td>
<td>According to high amount of total phenyl compounds and the controlling ability of free radicals and the controlling ability of Myrtus communis linn extract on polyphenol oxidase enzyme, it could be used in terms of increasing survival of food products exposed to Melanosis like shrimps.</td>
</tr>
<tr>
<td>Myrtus communis linn</td>
<td>Verica and Petar</td>
<td>2014</td>
<td>Assessment of antioxidant and antimicrobial activity of Myrtus communis linn extract</td>
<td>The results showed that the extract and essential oils of Myrtus communis linn have antimicrobial and antioxidant effects and could be used to overcome resistance pathogenic microorganisms against conventional antibiotics and antioxidants.</td>
</tr>
<tr>
<td>Myrtus communis linn</td>
<td>Carlo et al</td>
<td>2010</td>
<td>Assessing the chemicals and antioxidant activity of Myrtus communis linn extract</td>
<td>The results obtained from the study showed that the extract contains highest percent of extract compounds through utilization of solvents such as water and ethanol; although the highest antioxidant and antiradical activity of the extract could be observed using solvents such as ethyl and ethanol. Moreover, the extract contained highest percent of phenol compounds.</td>
</tr>
<tr>
<td>persicum Heracleum</td>
<td>Khorshidi et al</td>
<td>2014</td>
<td>Study of inhibitory effects of tannin and saponin compounds in persicum Heracleum on E. coli, Salmonella Enteritidis, Staphylococcus aureus and Bacillus cereus</td>
<td>The results showed that this extract could be used as an antimicrobial herb in addition to traditional uses.</td>
</tr>
</tbody>
</table>

Conclusion
Using medicinal plants has been considered since ancient times by people to treat types of diseases. Wide range of medical uses of Myrtus communis linn, persicum Heracleum and Aloysia citrodora referred in old and reliable proses could indicate endless science and experience of scholars of Iranian Traditional Medicine. Different components of these herbs have been used since centuries ago all around the world traditionally for types of diseases. Recent empirical studies have shown wide range of medical effects of these plants such as antioxidant, antiviral, antibacterial and antifungal effects. As medicinal effects of Myrtus communis linn, persicum Heracleum and Aloysia citrodora have been proved in numerous studies in Iran and other countries, there are a few clinical trials in this field. As a result, it would be better to conduct clinical studies and trials to confirm the said medicinal properties for the Myrtus communis linn, persicum Heracleum and Aloysia citrodora in scholarly articles.
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