Original Article: A Review on Some Species of Genus Artemisia

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ABSTRACT

This study focused on some species of the genus Artemisia. The use of medicinal plants is as old as the intellectual life and development of human consciousness. The reason is that diseases are born with human origins and the documents of several thousand years in the history of medicine and pharmacy contain valuable experiences and information of herbal medicine. This research aimed to better identify medicinal plants and their correct use of native plants. Medicinal uses have been various and many of them are still used. One of the most widely common applications of artichokes in traditional medicine has been its use as an anti-parasitic drug. Artemisia is a genus of chicory (Compositae) Asteraceae and has 34 species in Iran, having the widest distribution after Astragalus. This genus has useful and valuable properties in various aspects (medicinal, forage, soil protection, botany, ecology, etc.). The species of this genus have special anatomical features that are widely distributed and adaptation of these species to difficult environments is effective.

Introduction

Chicory genus

Chicory genus is one of the major genera of dicotyledonous plants and the last genus of this group. These plants are generally herbaceous, rarely woody or twisted, with alternate and simple leaves or more or less truncated and in various shapes. The genus Chicory has about 1000 genera and 20,000 species that are distributed almost all over the world. This genus is divided into 4 sub-genres. The genus Artemisia belongs to the genus Radius [1-5].

Vegetative device specifications

In this large genus, the types of vegetation are seasonal, annual and perennial grasses, and rarely shrubs. These plants have adapted to almost all different environments and altitudes, and the dense cover of species of this genus that grow at high altitudes is very impressive. Underground storage organs are present in some dark species such as

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dahlias and pickles. In the shoots of these plants, the storage material is inulin [6-9]. The leaves have many different shapes, but the common feature of all of them is the lack of earrings. In most dark plants, pehang has deep cuts with different shapes. The leaves of mountain plants are also usually covered with a thick coat of hairs. Many have thorny margins. They have a special reproductive system since there are countless flowers on the surface of the mound of these plants; the mounds are called composite flowers and for this reason the composite or composite was given to this genus. In previous writings and translations, the name of this gens has been written as Markaban. The number of flowers in the mounds varies. In the Artemisia mounds, the number of flowers is very small. Insect pollination in the chicory genus is highly adapted to the maximum inflorescence evolution in this genus. Self-fertilization is almost very rare because the pollen grains arrive before the stigma is ready to receive the pollen [10-15].

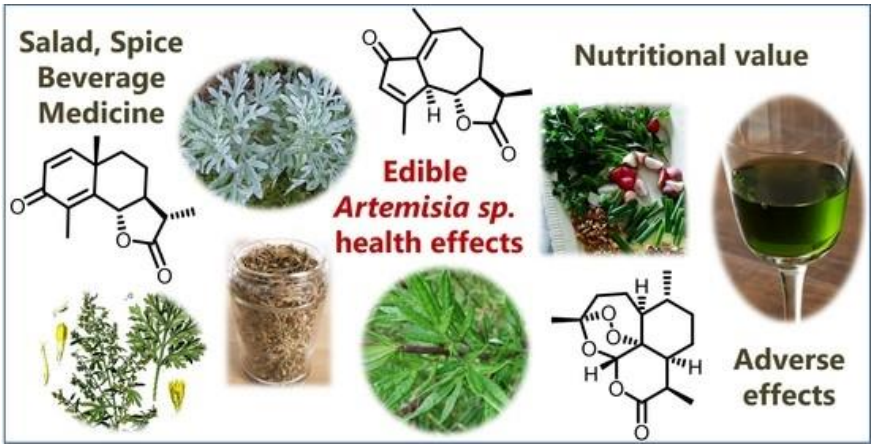

Figure 1. Foods | Free Full-Text | Research Advances on Health Effects of Edible Artemisia Speci

Under the dark beams (radio)

The plants of this subfamily have certain characteristics that are of undeniable value in recognizing them. The clusters in the plants of this subgenus have heterogeneous flowers, i.e. unisexual male and female flowers, always with neutral flowers that are in a definite order. This subgenus has many genera that are in different tribes. Baboon tribe is annual or perennial or semi-woody plants with alternating leaves whose petiole often has deep incisions. Heaps with flowers are radially and heterogeneously disk-shaped or homogeneous and plate-shaped [16].

Artemisia (Artemisia)

The most important genus is chicory, which has about 400 species in the world. Artemisia has been called in various books with the names of Sheikh, Talakhe Vyushan. Artemisia and astragalus cover most of the rangelands, mountains and deserts of Iran. The plants are annual, biennial or perennial, herbaceous or semi-woody, with or without hairs. Fluffy cover (if any) consists of diverse, bifurcated, rarely stellate hairs.

The leaves are alternate, with shoulder divisions, or deep shoulder segments, or 2 to 4 times deep shoulder segments, rarely full or cut at the end, the leaves are narrow or petiolate, and the stem leaves are almost often without petioles. The inflorescence is clover-like, petiolate, and the stem leaves are almost often petiole-free. The inflorescence is a rod-shaped cluster or spike-shaped cluster. The leaves are often oblong, evenly overlapping, and their inner rows often have a membranous margin. The socket is flat or convex, without hairs or fur.

The flowers are all tubular or in male-female clusters and their tube has 5 teeth at the end. In heterogeneous mounds, the female marginal flowers have a thin, cotton tube, rarely oblique, and have two teeth. The cream of these flowers is often elongated and protruding from the cup. The central flowers of the male are fertile or their ovaries are degenerated and the sterilization and tube of the cup have 5 teeth. The hazelnuts are hairless, tablet-shaped, without sides and compact, and often flat.

This genus has 31 species in Iran that go extinct in many places [17].

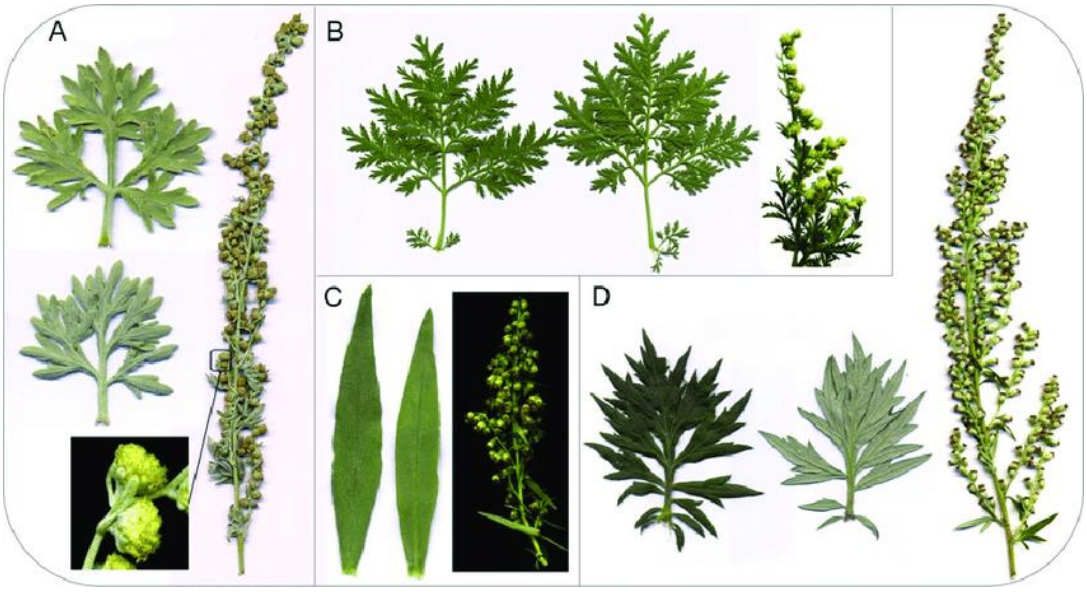

Figure 2. Leaves and synflorescences of four Artemisia species

Many species of this genus are used in industry and medicine. Almost all of these plants are fragrant and sometimes have a pungent odor. Pollination is done by wind. The fame of this genus is due to the production of terpenoids in all parts of the plant and has long been known as a source of essential oils.

Characteristics of Artemisia Siberian

It is an artemisia species, shrubby plant, grayish green, very branched, dense cushion-shaped or lying on the ground, 10-50 cm high with thick vertical woody roots, branching at the end. Stem Flowering stems small or numerous, firm, hard, erect, sometimes oblique, broad, creeping-erect, grayish-gray in parts apparently hairless, straw-colored, with temporal branches at the bottom. Leaves Grayish, covered with soft hairs, or apparently hairless, in young sterile branches or petioles, 8-15 cm long, their petiole has a circular perimeter, with two deep shoulder splits with spearhead parts, flat , with a circular end, 1.5-1 × 0.5 mm, at the bottom of ordinary stems and their middle almost without petioles, with three-part divisions, at the base with earrings, endless stems in the flowering part in the form of brackets , with claw divisions, pointed at the tip of a spear, at the linear-complete end and at the bottom into several sections [18].

Flower Yellow exists in very small clumps, complex in panicle inflorescence, with broad, horizontal or oblique branches, oblong, branched, with branches with 1-4 wide clusters, without pike, more or less dense and compact, with 4-5 florets 3 mm long, ovate-broadly elongated, the brackets with outer brackets are almost ovoid, green, convex, on the dorsal surface of the neckline; the inner ones are broadly elongated - apparently without scales. It is found in large parts of Europe, the Americas and Asia.

Its main origin is in Europe from the Mediterranean to Scandinavia and Alaska and in Asia from Kam Chatka to Siberia and India and China. In Iran it is found in the following parts: Northwest: Khamseh, Mahabad; west: Arak; Central part: Shurab Ninety-one Ardestan, between Ardestan and Nain, Murjeh Khort, Kashan Deh Bala, Deh Abad towards Zeidabad, Shepherds in Yazd, Mazriya near Nain, area behind Yazd mountain, Robat behind Badam, south; Around Ardakan Fars; southeast: Mahan Kerman; northeast; Birjand, Khashtak mound between Sabzevar and Kashmar, Gonbad, Tabas, between Tabas and Ferdows, Semnan, Damghan, Bastam, Mian Dasht in the southeast of Shahroud, Delbar Tehran and surroundings, Garmsar, Chitgar, Rudshour between Varamin and Sharifabad, Madad

Abad, Clock, desert near Cheshmeh Sefid, Mubarakiyeh Binkooh and Namak Lake, Kushk Nusrat between Tehran and Qom type of growing areas.

One of the most important shrubs in the rangelands is Artemisia plant, which due to the diversity of ecological demands, has many species and forms large communities of natural cover of steppe and semi-steppe regions of the country [19].

Artemisia plain (Artemisia) in Siberia semi-desert and desert steppe vegetation has a prominent presence. This species grows from an altitude of about 800 meters to 2000 meters with a rainfall of about 100 to 200 mm. It is one of the important plant elements in the cover composition of plants. In fact, the evolution of vegetation due to degradation, overgrazing, shrubbery, etc. as a substitute species has been gradually established and expanded with the elimination of declining and high-quality species. Geologically, this plant is mainly found on oligomotion manganese sediments, igneous and fire rocks (second and third periods) and schist and gneiss rocks of Snifracambrian.

This species is observed in soils with sandy texture, loam and clay and fine-grained to very fine grains of shallow to medium depth and depth [20].

Suitable characteristics of plain artichoke for growth in desert areas

Due to the high canopy surface, this species has an important role in preventing the destructive effects of rainfall and reducing runoff; as a result, this mechanism prevents surface erosion and water infiltration into the ground, which leads to increased groundwater resources. Plain artichoke also has two types of leaves, one is winter leaves that fall late in the rainy season and the other is very small summer leaves that replace large leaves, thereby reducing evapotranspiration in the plant and its greater uptake from the soil. The plant grows in arid and semi-arid regions [21].

Plants used and growing season

Phytochemical and pharmacognosic research show that there is a significant amount of syntonin, an industrial drug, in the aerial parts of such organs, especially at the head of the branches, which reaches its maximum in the time before the capillaries open. This is the best time to harvest the organs and extract the material. Phenological studies of the plant show that its vegetative growth begins in mid-July and lasts until late August.

Important chemical compounds of the plant

As mentioned, based on phytochemical and pharmacognosic research, the presence of santonin in the shoots, especially the branches of this species have been proven. Santonin has anti-parasitic properties and artemisia species is much more important in this regard than other uses. In the organs of this plant, in addition to santonin, the substance artemisinin also has antiseptic properties, which is used to kill and repel pests and harmful insects. The amount of santonin is 2.69% and volatile essential oil is 3.44%. It should be noted that in addition to these substances that have medicinal value, the presence of minerals and relatively high levels of protein in the branches of this plant also shows its forage importance. Secondary metabolites and chemical compounds are also present in the oily extracts of these two species. In the case of artemisia species, these elements include:

Camphor, 1 and 8 - cineole (11%), bornyl acetate (6%), trans-verbenol (3%) and londolol (3%) and in the case of Artemisia santolina, including: naryl acetate (13%), Bornyl acetate (11%), Trans and Rebenol (10%), Lewandolol (9%), Linanol (7%) and 1- and 8-Cineol (6.5%) Secondary metabolites of a plant play an important role in the production of chemicals to defend against predators and agents. They play a pathogenic role and can also play an important role in the production of important chemical compounds of the plant with the help of high light radiation or UV rays.

Figure 3. Field pictures of seventeen Artemisia species at the time of collection

Properties of artemisinin (artemisinin)

It is a cesquito-terpene lactone that is a natural anti-Plasmodium substance. It is also effective against a variety of Plasmodiums that have become resistant to chloroquinones and other synthetic anti-malarial drugs, and its other advantage over chloroquin is its lower toxicity. It contains a natural endoperoxide compound and also produces free radicals, which are among the factors affecting its anti-malarial properties. Some sources consider this substance to be one of the fastest killers of schistosomiasis compared with other antimalarial drugs.

It is similar to needle-shaped crystals, its melting point is 157 degrees, its chemical formula is C15H22O5, its optical rotation is C = 10695, and it is soluble in most ordinary solvents and dissolves slowly in oil [22].

Mechanism of action of artemisinin

In microbial studies, it has been observed that this substance is effective in membrane structure. Also, in cell culture studies of blood parasites, membrane morphological changes of the parasite have been observed. In other studies, the mechanism of action has been observed through alkylation of parasite-specific proteins. Microscopic studies show that artemisinin reacts with the parasitic membrane in cell culture medium, damaging the mitochondria and endoplasmic reticulum, and parasitizing changes in the nucleus accumbens and ribosomes and food vacuoles. One of the methods of action of artemisinin is the production of free radicals. H_2O_2 and hydroperoxide organs generate free radicals of central peroxide and carbon, which damage biological molecules.

Bornyl acetate compound is insect repellent, muscle relaxant, expectorant, antiviral and antispasmodic, sedative and antimicrobial. Camphor is Antispasmodic, antiseptic, antioxidant, antiemetic, antidiarrheal, anti-acne, analgesic, herbicide, fungicide, expectorant, anticonvulsant, cosmetic, anti-cancer, anti-itch, analgesic nervous, respiratory stimulant, nematode lethality, insecticide, insect repellent, anti-irritant and anti-flatulence. This chemical compound relieves fatigue, has antibacterial, anti-acetylcholinesterase, anti-parasitic, allergenic, acaricidal, anti-laryngitis, anti-inflammatory and anti-bad breath properties. It is effective in treating bronchitis and sinusitis.

Analgesic, anti-candida, central nervous system stimulant, anti-ulcer and cough, antifungal properties, anti-nematodes, stomach protector, anticonvulsant, bleach, cytochrome 450 P producer, sedative, antihypertensive, and liver booster. It is also Trichomonas Application of Artemisia plant in

traditional medicine. Artemisia has been mentioned in traditional medical books and in the list of traditional medicines, in different places and even in several versions of the books of Shaykh al-Ra'is Ibn Sina's law. Herbal poultice has been used in the treatment of hair loss.

It is said that it is good if it is placed at the site of a scorpion bite. Artemisia species that contain the active ingredient santonin are also used as antiparasitic drugs. As brewed Turkish artichoke is used to repel intestinal parasites, it has a traditional use and it is also useful in the form of incense to relieve colds and shortness of breath. It is widely divided that for wound healing, repulsion of pumpkin worm, antidote to scorpion stings and antidote to all insects has been considered and it has also been considered effective in jaundice (jaundice) [23].

It has divided the Roman and Turkish types, also known as blue hawks and thieves. Its use is recommended to relieve swelling and dullness, eye sores, difficulty breathing (breath), anti-worm medicine. Its oil is also used for fever and chills, hot blood inflammation of the liver, and as a substance that, after burning its smoke, has been used as an effective substance in repelling insects and treating animal bites.

Artemisia is burnt to remove the white spot or white curtain that is visible, in poisoning with the plant and the crown of the plant, the symptoms of which are a feeling of tightness in the areas and ducts of the small tongue, palate and esophagus and a feeling of suffocation in the lungs. Artemisia oil has also been used in gynecological diseases and in the treatment of obstruction and tightening of the uterus. In the book of law, the use of artemisia is considered useful in some combination species, along with other drugs [24].

It has been useful for treating any kind of poisoning. Artemisia is employed in the treatment and strengthening of hair and increasing hair growth, and when a disease causes hair loss. In a concoction called Zamehran Bozorg, which has been named as a medicine of Indian physicians, it has been used in the treatment of indigestion and stomach dysfunction. Artemisia is one of the compounds used in another concoction called blade, which is used in the treatment of paralysis and in strengthening memory.

Artemisia, which is used for rinsing teeth and for painful teeth, also contains artichoke. Artemisia has been used to treat koji. (Spine is defined as the dislocation of the dorsal vertebra and its tendency to the outside and back).

Research on some species of the genus

Different species of Artemisia have different medicinal properties that are used in traditional and modern medicine. The extract of Artemisia bruifolia has been found to be effective against this parasite. Idiris *et al.* (1982) also studied the antiparasitic effect of Artemisia herba-alba on the parasite Hemecus contortus in sheep and observed that the extract of Artemisia herba had an effect on the above parasite and reduced the number of parasite eggs in the feces. The results showed a significant effect of the plant extract on all three parasites mentioned.

As shown in various studies, compounds isolated from artemisia plant, especially Anwa species, have been used purely or after structural treatment, in the treatment of malaria. These compounds such as artemisinin, Artiter, artesonite, dehydroartemizine and artelinic acid have intense in vitro parasitic activity (50-1c = 50-1c ng / mL) and the parasite cleansing effect from the patient's blood during 48 hours. Radar is currently the most effective and powerful antimalarial drug.

The anti-malarial effect of Artemisia ludovisiana ethanolic extract by Malacon *et al.* (1997) on mice infected with Plasmodium urea was observed in the plant and found that their reproduction was limited to 98.6% within 5 days. Allen *et al.* (1997) demonstrated the coccidiostatic property of Artemisia annua. In these experiments, which lasted for 5 weeks, 1% of the powder prepared from the leaves of the plant was added to the diet of some chickens. Experiments have shown that artemisinin at 17 ppm is effective against Imeria tenella and Imeria acerolina [25].

According to a study by Tawfiq *et al.* (2005), the half-life of injured parasites in antimalarial treatment with artemisinin was reported to be 2.7 hours. Kim *et al.* (2005) also examined the effect of artemisinin obtained from Artemisia annua on the blood parasite Neospora caninum during field experiments and observed that concentrations of 10 and 20 μg/mL of this substance were present for 11

days. All these parasites were completely eradicated.

Torabi *et al.* (2003) investigated the anticoccidial effects of Anwa on Emeria tenella in broilers, along with the anticoccidial drugs used in the experiment, which included salinomycin and amprelium.

Artemisia antimicrobial effect

Erdonzo *et al.* (2001) investigated the antimicrobial and antiarrhythmic effect of Artemisia absintom liquid extract. The culture medium and the extract were found to have antimicrobial and giardia activity, consistent with the traditional use of this plant [26-28].

Antifungal effects of Artemisia

In a study conducted by Mansouri *et al.* (2004), the effect of 5% Artemisia Siberian lotion was compared with the effect of clotrimazole (antifungal chemical) lotion on Tinea versicular fungus. Clinically, it improved patients by 77.42% at the end of the second week and 93.5% at the end of the fourth week. While the rate of this effect was 60.7% and 57.14% for clotrimazole at the mentioned times. Also, in microscopic studies, the negative samples were observed in Artemisia siberia by 87.1% in the second week and 100% in the fourth week. As for clotrimazole, this rate was 69% in the second week and 61.15 in the fourth week. These results show that Artemiria siberia is more effective against this fungus than clotrimazole, which is an antifungal drug.

Cordalli *et al.* (2005) performed experiments on the oil extracts of three species of Artemisia, including Artemisia absintum, Artemisia santonicum and Artemisia spicira, and evaluated their antifungal effects [26]. According to the results of these experiments, the effects of each of the three medicines Showed significant antifungal.

On other effects of different species of Artemisia, Yang *et al.* (2004) demonstrated in experiments that Artemisia annua has immune-boosting effects and anti-tumor activities. Lucendra *et al.* (2005) investigated the antidiabetic effect of ethanolic extract of Artemisia draconculus and observed that, as a result of the effect of the extract of this plant, the activity of the enzyme responsible for liver involvement (ALR2) was reduced by 40%.

Quercetin, the most well-known chemical drug in liver disease, had a 54% effect on this enzyme.

Conclusion

The reaction and establishment of plants is mainly under the influence of environmental conditions and internal factors of the plant. Species of the genus Artemisia artemisia in Iran are widely distributed in arid and semi-arid climates. During this study, ecological conditions were compared and the effect of environmental factors on the morphology and anatomy of Artemisia species was studied. The services of Muslim scholars and scientists such as Jabir ibn Hayyan, Zakaria Razi, Abu Nasr al-Farabi, Abu Ali Sina, and the like, who were the forerunners of the chemical, medical, and pharmaceutical sciences of their time, are so great that human societies are still exposed to them. Until a few decades ago, what was used as medicine came from natural sources, mainly plants. In our country, a large area of plains and pastures are covered with plants that have different medicinal properties.

Different species of Artemisia plant are different in terms of having different properties and different uses compared with many other plants and have multifaceted values. The substance santonin in its branches has medicinal effects and is used to repel the parasite. With the rapid advancement of science, on the one hand, and economic issues, on the other, the use of medicinal plants has declined in the past, and chemical drugs have in many cases replaced plants.

The experience of the last few decades has shown that chemical drugs with full efficacy have many adverse effects and it has become clear that there is the least pure substance that has no adverse effects and these adverse effects are applied both through direct treatment and through the penetration of some. These drugs act on the soil and their absorption by plants used by humans and animals, and among them, levamisole can be named. For this reason, the return to the use of medicinal plants has received much attention and universities, research centers and the World Health Organization (WHO) have extensive plans for the use of medicinal plants. These centers have considered the role of medicinal plants in relation to various substances in the 21st century crucial.

However, the correct use of medicinal plants is subject to the availability of accurate and scientific information. The issue of drug resistance is also considered a warning to reconsider the use of chemical drugs, and of course antiparasitic drugs are no exception and resistance to them has been developed to varying degrees. On the other hand, parasitic infections are currently considered as many and serious chronic diseases and cause widespread infections in all parts of the world, including Iran.

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