

The Evaluation of Medicinal Properties of *Perovskia Abrotanoides* Karel

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Abstract: Medicinal plant Borazambol with the scientific name of *Perovskia abrotanoides* Karel. belongs to the family Lamiaceae. It is growing wild in the margin of mountainous roads of arid and cold climate of North Iran. It is for a long time that indigenous people by different methods in traditional medicine use its products in preventing and curing diseases. In this research beside obtaining ethnopharmacological data to investigate and compare the most important secondary active materials of different organs the soil with the texture of clay loam, gravel loam and neutral pH collected from two natural habitats located in North Iran. *Perovskia* Bush besides being used in traditional medicine and the great history among Iranians is having important medicine properties. The results of ethnopharmacological investigations of local shepherds and healers in both regions shows the ecological importance of that species and this plant is used in grazing and traditional medicine with other medicinal and local plants in the region. This plant is mostly used as fortifier, antiseptic, rheumatic pains, anti-inflammatory, leishmaniasis, anthelmintic. The significant combinations in organs are terpinolene, Verbenone, sabinene, terpinen-4-ol and - terpinen.

Key words: *Perovskia abrotanoides* Karel • Ethnopharmacology • Essential chemical combinations • Different organs • Secondary effective materials • North Iran

INTRODUCTION

The reason of the inclination of World Health Organization (WHO) to medicinal plants is the diseases caused by unduly consumption of chemical medicines in the world. To do this, the first stage is the exact identification of native, wild and medicinal or fragrant species of different parts, the identification of ecological demands, extracting effective medicinal substances and qualitative and quantitative diversity of them in special habitats [1].

So the identification and using local clues, important traditional information of different cultures and folklores about the type of medicinal species, the place and time of crop, consumption and method of consumption and etc are the most important parameters [1].

History of using spices, additives and other aromatic substances are one of the interesting parts in the history of the world. Using Spices and especially salt dates back to old times. Archeological excavations show that pre-history human being applied the leaf of some of the plants to give flavor to his undercooked food.

The consumption and production of spices in ancient civilization including China, India, Babel, Egypt, Greece and ancient Rome were common. Considering the fact that most of the aromatic species of Lamiaceae families have the best medicinal performance in diseases such as gastric, infectious and antioxidant and they are mostly used in food and prevent food decay.

Considering the economical value, especial position of aromatic medicinal plants in community health, they are considered more by scientific and research centers. Global trend is toward applied researches about the identification of the species, habitat conditions, obtaining important ethnopharmacological data from local healers and above all the investigation of the effective secondary and medicinal material with the aim of formulation and production of effective and safe natural medicines in accordance with their performance in traditional medicine [2].

It is estimated that today 70 percent of the communities in the world use various medicinal plants in different forms in daily life; diet and disease cure [3].

Flowering Stage of this Plant is Starting from Tir to Shahrivar:

Perovskia L. is the local name of Perovskia abrotanoides Karel. belonging to the family of Lamiaceae in Iran and is consisting of 3 species and P.abrotanoides species is extensively found in these two provinces [4] and are growing wild in Iran, Afghanistan, Pakistan and Turkmenistan and is found as an aromatic plant in Golestan, Isfahan, Khorasan, Mazandran and Sistan and Baluchistan [5-8].

Field observation in this research for natural habitats and ecological needs identification, showed the plant had wide habitats dry-cool and silty - clay - loam soil, with PH=7.5-7.7 and EC=0.53-2.5. Phenological data showed that vegetative periods begin May and flowering time in August to September. By the increase of the height of this plant in 2300 m, in addition to the increased of effective materials, annual growth cycle of the plant is done with 20 days delay and the color is increased [9].

History and Traditional Medicine: Plants fossils date back to 2.3 million years. These plants are the basis of animals and human being life in the world. Plants provide the energy and constituent elements of body, metabolism-adjusting vitamins and medicines effective substances [10]. Using plants to cure diseases is simultaneous with human being life [11]. Although by the development of medicine industries (chemical) in the early 20 th century, herbal medicines have lost their validity in completion with chemical medicines, due to the side effects of chemical new drugs, medicinal herbs have attracted the attention of people due to the lack of any side effect on the body. Curing effect of the plants in 1933 was proved by scientific criteria and the effective substances of these plants are used in the modern medicine and their benefits are proved by great pharmacopoeias in the world [12].

For centuries, medicinal natural plants are used to prevent bacterial disease [13]. There are many infectious diseases that are related to herbal medicines in human history [14].

In Pakistan P.abrotanoides is used as refrigerant [15]. In china, P.abrotanoides is used in curing atherosclerosis, cardiovascular diseases, liver fibrosis and other diseases [16]. The studies of traditional medicine showed that *P.abrotanoides* is used as a pain-killer and anti-inflammatory and this is proved in animal model researches [7, 16, 17].

In another research extracts of P.abrotanoides showed that the herbal tea of this plant is used in curing infection problems and painful urination two times a day for 8-10 days [18]. Rustaian *et al.* [19] indicated that this plant is used as refrigerant. Also the anti-bacterial activities of its essential oil is reported [19]. Its antioxidant performance including heart enhancing, inhibiting eduz Reductekaz and its optimized performance as cell toxicity in pathogens, viruses and cancer cells are reported [15, 16].

Researches showed that essential of Cuminum cyminum and Perovskia abrotanoides Karel. is consisting of anti-pathogen against storage pest and they are the most important chemical combinations of essential of monoterpenoids that are mostly used as pesticides [8]. In another research the anti-plasmodium property of floral aerial of P.abrotanoides against Plasmodium falciparum parasite [20]. In the south of Iran, the dried stem powder of this plant is used for treating dermal leishmaniasis and its medicine is used on wound to relieve pain [6].

Effective Substances: Different researches showed that most important is floral aerial and stem, extracting essential and its analysis is started. In Iran are including terpinen-4-ol, -terpinene, Verbenone, terpinolene, sabinene, viridiflorene and (Z)--ocimene [9].

Clinical Modern Medicine: The investigations of traditional medicine showed that *P.abrotanoides* is anti-inflammatory, anti-pain and this is proved in animal model researches [7, 16, 17]. According to the reports, villagers in the Isfahan province of Iran apply a poultice, made of crushed roots of the plant, water, sesame oil and wax, on lesions caused by cutaneous leishmaniasis [6, 16]. In Golestan province P.abrotanoides is used to treat leishmaniasis and dermal problems [20].

Aerial branches of P.abrotanoides are anti-inflammatory and anti-pain [7, 17]. In another research the anti-plasmodium property of floral aerial of P.abrotanoides against Plasmodium falciparum parasite and cytotoxic activity are shown [20]. Arabi *et al.* [18] believed that essential oil of P.abrotanoides plays an important role in protection of stored grains and reducing the need for it [8].

The researchers attribute the amount of essential compositions to genetical and environmental factors [21, 22]. Besides, there is a great difference between the existing combinations of essential of one species in different growing conditions [22, 23].

Jaafari *et al.*, [6] reported that ethanol extract of the stems and leaves are due to the presence of phenolic and terpinene compositions are anti-leishmaniasis and anthelmintic. This medicinal plant is proved to treat anthelmintic and leishmaniasis. Morteza Semnani *et al.* [5] believed that due to the quality and quantity change and the difference in the performance of *Perovskia abrotanoides* essential extract, different habitat, ecological conditions change, different times for collecting the plant, drying condition and extracting and they prove the difference of effective compositions in different organs and habitats of the plant.

In a similar research, Pourmortazavi *et al.* [24] reported that effective compositions of floral aerial essentials of *Perovskia abrotanoides* in Tehran are different from quality and quantity amounts of terpinene and phenolic compositions.

Kayser *et al.* [25] referred to the extract of *Perovskia abrotanoides* æ *Artemisia sieberi* æ *Berberis vulgaris* and Pomegranate peel as the most important factors of removing intestinal worm and leishmaniasis parasite and this proves traditional consumption of this plant with other species in treating parasite and leishmaniasis wound [26].

Obame *et al.*, [1] argued that consuming essential oil of *Perovskia abrotanoides* is effective in washing wound, anti-ring worm, dermal parasites and anti-fungus and this is due to the presence of terpinene of the essential and phenolic compositions and anthocyanin the extract of floral aerial of the plant.

Vokovi *et al.*, [27] reported about terpinene and phenolic compositions in floral aerial of *P.abrotanoides* in vitro conditions as good anti-pathogenic property against 13 pathogens. In this research terpinene-4-l in the extract of aerial plant of *P.abrotanoides* is used as a strong pain-killer, anti-inflammatory that it has 35% muscle loosening and anti-pain [28, 29].

Cetin *et al.*, [30] refers to phenolic composition of rosmarinic acid and terpinene-4-l in Rosemary aerial and *P.abrotanoides* as the most important anti-inflammatory compositions, antioxidants with the effect of anti-spasmodic and anti-pain in treating rheumatic, arthritis and muscle spasm.

Terpinene-4-l was reported as the most important compositions of essential of the leaf in Chaman Bid. Also, one of the most important compositions is ginger and turmeric and the researches showed that it is anti-inflammatory, pesticide, anti-parasite especially against leishmaniasis and this is obvious due to the high amount of this substance in the essential of the leaf of Chaman

Bid(Iran) to prove the effect of anti-leishmaniasis of the leaf and root of the plant in traditional medicine. Golshani *et al.* [26] referred to Verbenone, phenolic and Flavonoid compositions of Rosemary extract as antioxidant, anti-inflammatory and antiseptic that is mostly used for relieving joint pins, rheumatism, arthritis, muscle pains and also for treating dermal infections and Lymph Gland infection and the amount of Verbenone in the plant organs of *P.abrotanoides* in both habitats are reported as variable from 4.9 to 31% and the amount of this substance in Chaman Bid floral aerial are more. In another research Sayyah *et al.* [31] showed that effective substance of Sabinene is one of the most important compositions of *Ferula gummosa* essential that give the plant the property of strong antiseptics, anthelmintic, anti-pain, stomachache, Rheumatism, Migraine and wound healing. The most important compositions of essential oil of different species of *Juniperus communis* especially, *J.sabina* that give the plant the property of anti-inflammatory, antiseptics and anti-bacterial in treating Urinary tract infection (UTI). Thus, the presence of the above compositions in floral aerial organs and leaf of the studied plant, verbenone (4.9%-31.2%), sabinene (1.7%-18.7%) and -terpinene (0.8%-19.8%) proves the anti-inflammatory and antiseptics and antioxidant effect of this plant. Fukumoto *et al.* [35] showed that p-cymene ‘-terpinene’ limonene in citrus are used as monoterpinene compositions of the essential to relieve pain, rheumatism and anti-inflammatory.

Mockute *et al.* [28] referred to sabinene (28.2-37.5%), terpinene-4-l (4.6-7.5%), gamma-terpinene (6.69.9%) in essential of *Daucus carota* as antiseptics and anthelmintic that are in different amounts in Italy.

Battaglia *et al.* [32] referred to verbenone and camphor in Rosemary and lemon extract and essential as stimulator of hair and skin, removing dermal inflammations, cold, influenza, expectorant and also anti-inflammatory in Rheumatism and Arthritis and antiseptic in UTI diseases and the above results prove the inclination of indigenous people toward traditional medicine to use floral aerial with the extract of herb venus and nettle are used as a strong anti-inflammatory, hair care and wound healing.

CONCLUSION

Perovskia abrotanoides Karel in the north of Iran is consisting of 3 species in which *P abrotanoides* Karel is growing wild in the margin of mountainous roads and arid and cold climate of Golestan and Khorasan Shomali.

In traditional medicine of mountainous villages of the province, the powder of floral aerial as singular and combinational is used as fortifier, antiseptic and anti-inflammatory in treating dermal diseases, rheumatic pains, anthelmintic in combination with other medicinal and indigenous plants of the region.

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