

The Evaluation of Medicinal Properties of *Ziziphora clinopodioides*

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Abstract: Blue Mint Bush with the scientific name of *Ziziphora clinopodioides* belongs to the family Lamiaceae. This plant grows in Iran, Iraq and central and eastern part of Turkey. This plant is one of the valuable medicine species in North of Iran that is used mostly in food and medicine. This plant is used mostly in traditional medicine of the people in that region as sedative and carminative, anti-vomiting and, anti-inflammatory and antiseptic in food. Blue Mint Bush besides being used in traditional medicine and the great history among Iranians is having important medicine properties. Some of the medicinal properties of the plant as the results of the researchers investigation shows regarding the anti-bacterial properties of Blue Mint Bush and inhibitory properties of its essential oil on bacteria. In this paper the effect of the flowery branches essential oil on Gram-positive bacteria and Gram-negative causing the food decay is investigated.

Key words: *Ziziphora clinopodioides* • Anti-bacterial • Traditional medicine • Clinical medicine • Food

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.

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.

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, the writer investigates the benefits of *Ziziphora clinopodioides* medicinal plant with the effect of anti-bacterial to prevent food decay bacteria.

Botanical Characteristics: *Ziziphora clinopodioides* belongs to Lamiaceae family with the Persian name of kakuti-e kuhi is a perennial plant with stemmy bushes, green or green-gray with the height of 10-50 cm, with different stems at the wooden stem, leafy, standing flowered stems, sometimes creeping, leading into capitulum, oval, pointed, circular, wide and long leaves, with hair or full of hair, leaves of flowering stem are like the other parts but smaller and wider, the flower is light or dark purple, without peduncle, gathered in masses and mass capitulum and end compact, ball shape or oval, wide and long, calyx with the length of 6-4(-3)mm, thing cylinder, hairy or thin hairs on each other or short toothed, linear-pointed with near apex and erected petal pipe from calyx. This species is the only perennial species in Iran that 9 of them are identified until now and mostly they are seen with Thymus.

Flowering Stage of this Plant is Starting from Tir to Shahrivar: *Z. clinopodioides* is found in Eastern Balkan Peninsular, south east of Asia and central Asia to Pamiralay mountains and Himalaya (Iran, Iraq and central

and eastern parts of Turkey) and Africa. Also it is found in Park Meli of Golestan province and Shahkub in the height of 2350m.

All aerial parts and seeds are used in medicine.

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. Using plants to cure diseases is simultaneous with human being life. Although by the development of medicine industries (chemical) in the early 20th 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 criterions and the effective substances of these plants are used in the modern medicine and their benefits are proved by great pharmacopoeias in the world.

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

Blue mint Bush is used as sedative, anti-spasmodic, recommended for gastric and heart and expectorant. In Iran, it is used as sedative, gastric pain, stomachache and carminative. According to the tradition of our ancestors, the dried aerial parts of this plant are used in cooking and curing cold and cough. Also, it is used in yogurt and other dairy products as additive and giving aroma to food. The seeds of this plant are used as anti-fever. Local people use the leaves of this plant as expectorant, carminative and in infectious diseases. The leaves, flowers and stem of this plant is mostly used as wild plant or additives, spice or fragrant substance in food and it is widespread in central and east of Turkey. In Turkey, it is used as Laxative, carminative, antiseptic and for healing wound. Also in traditional medicine of east of Turkey it is used as additives in a special cheese called as fragrant cheese with thyme, garlic and etc.

Effective Substances: Different researches showed that most important substance in this plant is Pulegone and then Iso menthone, menthol, menthone 1,8-cineole, thymol, p-cymene, carvacrol, terpinen-4-01, Linalool, piperitone, menth 3-en-8-01, *Limonene* and B-pinene[1-8].

Clinical Modern Medicine: It was shown in a research that effective substances of blue mint bush are anti-tumor and reduce the growth of malignant tumors to 32.6% and cancer glands to 47.55. The main substance of this plant is Pulegone and it is anti-bacterial and anti-fungus and is effective for Salmonella bacteria.

Pulegone can prevent the growth of *Ca. albicans* fungus and *S. typhimurium* bacteria and its effect on *Ca. albicans* is double the effect of Nystatin. The observations showed that essential oil of blue mint bush is effective against Gram-negative bacteria *E. aerogenes*, *K. pneumoniae*, *S. enteritidis* and also it has inhibitory and anti-bacterial effect but it doesn't have any effect on *PS. aeruginosa* and *Sh. dysenteriae*. The researches showed that the essential oil of this plant hinder the growth of *PS. aeruginosa*. Blue mint Bush essential oil is anti-bacterial against *B. cereus*, *St. aureus* and *Li. monocytogenes* bacteria.

In the research of Kivance and Algol the anti-bacterial effect of Turkish blue mint bush essential oil on Gram-positive bacteria as *St. aureus* and *B. subtilis* is observed [9-18].

Anti-bacterial and anti-oxidant activities of reported methanol oil essential can show the presence of Pulegone found as 80% in volatile oil and also *Limonene* and *Piperitenone* can be responsible in the activity.

The previous studies showed that *Pulegone* and *Limonene* are anti-bacterial. Most of these researches showed that the sensitivity of Gram-negative bacteria against anti-bacterial compounds of the plant are little in comparisons with Gram-positive bacteria and it can be due to the presence of external membrane in the cellular wall. Also in Gram-negative bacteria *Sudomonase* especially *PS. aeruginosa* has the least sensitivity against herbal essential oil.

In the research of Ghafari *et al* the anti-inflammatory effect of *Z. clinopodioides* was done due to the reduction of Epidemic cells with oxidation activity and they found that the essential oil of this plant inhibits acetic acid toxic reactions in the rats bowl and this is due to the inhibition of oxidative stress of cellular texture. Exact clinical investigation should be done to prove the similar activity on human being [19-22]. Following the reported researches, the anti-bacterial effects of *Z. clinopodioides* especially against food decay bacteria is very effective in proving its consumption in traditional medicine. We can say that aerial parts of *Ziziphora* are having extensive anti-bacterial activities against food decay bacteria.

CONCLUSION

Blue mint bush essential oil has inhibitory effect against food bacteria. According to the results, Blue mint bush essential oil is used as a natural flavoring and stabilizer in food products. Blue mint Bush is recommended for gastric pain. The powders of its leaves are used for giving aroma to food. It is expectorant and carminative. The researchers showed that as WHO has emphasized on reduction of salt to prevent heart disease in all over the world, by reduction of salt in processed foods, the consumption of other additives to stabilize foods can be a benchmark for using new safe methods by natural or green methods and one of the is the application of herbal essential oils as anti-bacterial additives. So we can recommend to used blue mint bush essential oil as a natural flavoring and additive in food products.

REFERENCES

1. Baser, K.H.C., E. Sezik and G. Tumen, 1991. Composition of the essential oil of *Ziziphora clinopodioides* Lam. J. Essential oil Res., 3: 237-239.
2. Baytop, T., 1996. Turkiye? de Bitkiler ile Tedavi. I.U. Yayinlari No: 3255, Eczacilik Fak., 40: 444. (in Turkish).
3. Burt, S., 2004. Essential oils: Their Antibacterial Properties and Potentiona Applications in Foods, a Review. Internationa J. Food Microbiol., 94: 223-253.
4. Cowan, M.M., 1999. Plant products as antimicrobial agents. Clinical Microbiology Rev., pp: 564-582.
5. Duru, M.E., M. Ozturk, A. Ugur and O. Ceylan, 2004. The constituents of essential oil and *in vitro* antimicrobial activity of *Micromeria cilicica* from Turkey. J. Ethnopharmacol., 94: 43-48.
6. Ghafari, H., N. Yasa, A. Mohammadirad, G. Dehghan, M.J. Zamani, S. Nikfar, R. Khorasani, B. Minaie and M. Abdollahi, 2006. Protection by *Ziziphora clinopodioides* of acetic acid induced toxic bowel inflammation through reduction of cellular lipid Peroxidation and myeloperoxidase activity. Hum. Exp. Toxicol., 25: 325-32.
7. Hill, A.F., 1989. Economic Botany. THM Edition, New Delhi, pp: 560.
8. Kivanc, M. and A. Akguel, 1986. Antimicrobial Activites of Essential oils From Turkish Spices and Citrus. Flavoar and Fragnance J., 1(4/5): 175-179.
9. Meral, G.E., S. Konyalioglu and B. Ozturk, 2002. Essential oil composition and antioxidant activity of endemic *Ziziphora taurica* subsp cleonioides. Fitoterapia, 73: 716-718.
10. Ozturk, S. and S. Ercisli, 2006. Chemical composition and *in vitro* antibacterial activity of *Sesil libanotis*. World J. Microbiology and Biotechnology, in press.
11. Ozturk, S. and S. Ercisli, 2007. Antibacterial activity and chemical constitutions of *Ziziphora clinopodioides*. Food Control., 18: 535-540.
12. Salehi, P., A. Sonboli, F. Eftekhar, Jad- S. Ebrahimi and M. You sefzadi, 2005. Essential oil composition, antibacterial and antioxidant activity of the oil and various extracts of *Ziziphora clinopodioides* subsp. Rigida (BIOSS) RECH. F. from Iran. Biol. Pharm. Bull., 28(10): 1892-1896.
13. Simonetti, G., 1991. The MacDonald Encyclopedia of Herbs and Spices. Macdonald and Co. (pub). Ltd. London, pp: 255.
14. Tabatabaei-Anaraki M., F. Chalabian, S. Masoudi and A. Rustaiyan, 2007. The chemical composition and invitro antibacterial activities of the oil of *Ziziphora clinopodioides* Lam. From Iran. Planta Med., 73: 10.1055/s-2007-986876.
15. Tarakci, Z., H. Coskun and Y. Tuncturk, 2004. Someproperties of fresh and ripened herby cheese a traditional variety produced in Turkey. Food Technology and Biotechnol., 42(1): 47-50.
16. Tepe, B., D. Daferera, A. Sokmen, M. Sokmen and M. Polissiou, 2005. Antimicrobial and Antioxidant Activities of The Essential oil and Various Extracts of *Salvia tomentosa* Miller (Lamiaceae). Food Chemistry, 90: 333-340.
17. Zargari, A., 1995. Iranian Medicinal Plants, Tehran Univercity Press, Tehran., 4: 103-105.
18. Maessume Mehraban Sangatash, Reza Karajian and Shahram Beiraghi Tousi, (January 15, 2007), The study of anti-bacterial effect of blue mint bush volatile oil on food decay bacteria- medicinal herbs, year, 6, Third Period, No. 23, Summer 2008.
19. Razie Taghavizadeh, Ahmad Majd, Fatollah Fallahian, Hassan Nazarian and Sadighe Mehrabian, 2008. The investigation of the characteristics of pollen and nectar plants to attract honey bee in Sirachal, Tehran Province Regions-Research of Natural Resources J. Spring, 2007. pp: 74.
21. Azadbakht, M., 2000. Medicine plants classification, Tabib Publication, pp: 401.

22. Shimelis, E.A. and S.K. Rakshit, 2005. Antinutritional factors and in vitro protein digestibility of improved haricot bean (*Phaseolus vulgaris* L.) varieties grown in Ethiopia. *International J. Food Science and Nutrition*, 56: 377-387.
23. Shimelis, E.A. and S.K. Rakshit, 2007. Effect of processing on antinutrients and in vitro protein digestibility of kidney bean (*Phaseolus vulgaris* L.) varieties grown in East Africa. *Food Chemistry*, 103: 161-172.