



## STUDY OF ESTERS OF ABSOLUTE ETHANOL EXTRACT OF THE CENTRAL ASIAN MINT PLANT

Saitkulov Foziljon Ergashevich <sup>1</sup>

Umarov Samandar Farxod o'g'li <sup>2</sup>

Tog'ulova Sevara Hasan qizi <sup>2</sup>

Tashkent State Agrarian University <sup>1</sup>

Student Tashkent state agrarian university <sup>2</sup>

<https://doi.org/10.5281/zenodo.10283585>

### ARTICLE INFO

Qabul qilindi: 01-December 2023 yil

Ma'qullandi: 04- December 2023 yil

Nashr qilindi: 07- December 2023 yil

### KEY WORDS

*cuisine, lamb meat sauces, juice, Arabic, Spanish and Italian cuisine, roasts, roast lamb, lamb and chicken.*

### ABSTRACT

*Mint is very popular in English cuisine, it is added to lamb meat sauces. In American cuisine, it is added to improve the taste and aroma of mixed drinks made from tomato juice and in various fruit and vegetable salads. In Arabic, Spanish and Italian cuisine, mint is served as a spice or added to various spice mixtures. Mint leaves enhance the flavor of roasts, roast lamb, lamb and chicken. It is added to stewed cabbage, carrots, peas or leeks.*

### Introduction

The progress of different materials with antibacterial properties appertains to a research area that is always in intensively expanding. Moreover, different materials have the potential to prevent the proliferation of strains, providing protection against a lot of pathogenic microorganisms such as *Escherichia coli* and *Staphylococcus aureus*, two species of Gram-positive and Gram-negative strains responsible for diseases such as skin and strong bloodstream infections. Some statistics from the Broad Institute showed that these bacteria were responsible for clinical infections in proportions of 18.8% (*S. aureus*) and 17.3 % (*E. Coli*). Because *S. aureus* and *E. coli* are bacteria resistant to a lot of antibiotic therapy, major concerns were raised in the public health field regarding the necessity to develop other new antibacterial compounds. For this reason, the current interest of science is focused on biodegradable polymers to be used for this purpose. Poly(vinyl alcohol) (PVA) is one of the best known environmentally friendly polymers and is obtained in a hydrolysis reaction of poly(vinyl acetate). The polymer is characterized by a lot of significant features such as water solubility, non-toxicity, chemical resistance, biocompatibility and biodegradability. One of its important features is the hydrophilicity. The hydroxyl groups from this structure support the good film-forming ability and intermolecular hydrogen bonding formation. For all the mentioned features, the polyvinyl alcohol polymer presented a lot of interest for the researchers. Moreover, the antibacterial compounds, such as extracted plants, are used to increase the capacity of biopolymers to kill microorganisms from the surface of the used materials. The composition of each extract varies depending on the plant and what extraction process is used. The medicinal plants contain several phytochemicals such as phenols acids,

flavonoids, alkaloids, terpenoids and tannins who possess a lot of bioactive properties and, among them, also different antibacterial effects. Thus, the antibacterial effect of these plants secondary metabolites is associated to -OH group(s) attached to the phenol ring. The phenolic acids represent a family of organic compounds that have a phenolic ring and a carboxylic acid group in their structure. The antibacterial effect is related to the number of -OH and methoxy (-OCH<sub>3</sub>) groups present. Due to their character of weak acids, they have the possibility to diffuse through the bacterial membrane, leading to cell death after the cytoplasm acidifying. Furthermore, the flavonoids, a huge group of bioactive substance, possess antibacterial activity against a wide array of microorganisms. Their antibacterial effect is probably due to the formation of some complexes with the bacterial cell wall and disrupts the cell membranes. Regarding the terpenes, they are some polymers of isoprene whose antibacterial effect was related to the presence of hydroxyl groups carbonylation of terpenoids or their lipophilicity/hydrophobicity, causing an alteration to the photorespiratory pathway [18]. Furthermore, another complex of polymers, tannins, exerts its antibacterial effect by complexing with proteins through both covalent and non-covalent interactions. Phytochemicals that are characterized by diverse mechanisms of action, and chemical structures are very attractive for therapeutic tools. The prepared manuscript uses five different herbs: *Lavandula angustifolia*, *Mentha piperita*, *Cannabis sativa* L., *Verbena officinalis* and *Salvia officinalis folium*. As described in literature, these plants were chosen because of their known antibacterial activity(1-16).

### **Material and results**

In modern cooking, leaves and aerial parts collected during the flowering period are used. Essential oil and menthol are obtained from them, which are widely used in medicine, perfumery, confectionery and alcoholic beverage industries, in the production of cognacs[1]. Mint is very popular in English cuisine, it is added to lamb meat sauces. In American cuisine, it is added to improve the taste and aroma of mixed drinks made from tomato juice and in various fruit and vegetable salads. In Arabic, Spanish and Italian cuisine, mint is served as a spice or added to various spice mixtures. Mint leaves enhance the flavor of roasts, roast lamb, lamb and chicken. It is added to stewed cabbage, carrots, peas or leeks(fig-1).



Fig-1

Small amounts of fresh shoots can be used to add to vegetable soups, meat marinades, and cheese dishes[2-7].

#### **The excremental part**

Peppermint leaf (lat. *Folium Menthaepiperitae*) and threshed peppermint leaf (*Folium Menthaepiperitaecontusae*) are used as medicinal raw materials. Harvesting is carried out in dry weather, when about half of the plant blooms.

In medicine, mint leaves are part of the gastric, carminative, sedative and choleric teas, mint drops for nausea as an appetite enhancer, and antispasmodic gastric remedy. From medicinal raw materials, tincture and "mint water" are obtained.

The main active ingredient in mint preparations is menthol, which is contained in the essential oil of the plant. In addition to the essential oil, mint contains terpenoids (limonene, cineol, dipentene), carotene, rutin, ascorbic, ursolic, oleanolic acids, flavonoids, tannins, and trace elements. It is used for inflammatory diseases of the upper respiratory tract, soothes headaches, improves appetite.

Mint leaves are popular in folk medicine. They are used externally for neuralgia, as an antiseptic for inflammatory processes, burns, diseases of the upper respiratory tract, hoarseness, hoarseness, bronchitis and bronchiectasis, toothache; inside - with gastrointestinal and hepatic colic, as an astringent, antitussive, with nausea, heartburn, as a sedative for nervous excitement in menopause.

Menthol, released from mint oil, is used for flatulence, angina pectoris, it is part of drops and ointments for the common cold, migraine pencils, and is also used in the production of a number of medicines - validol, valocordin, ingafen, olimetin, Zelenin drops and others used in diseases accompanied by spasm of the coronary vessels, smooth muscles.

When studying the chemical composition of plants, they contain essential oil (Peppermint oil) (2.4–2.75% in leaves, 4–6% in inflorescences), tannins and resinous substances, carotene (0.007–0.0075%, in leaves 0.0105–0.012), hesperidin, ascorbic (0.0095%), chlorogenic (0.7%), coffee (0.5–2%), ursolic (0.3%) and oleanolic (0.12%) acids, rutin (0.014%), betaine, arginine, neutral saponins, glucose, rhamnose, phytosterol. Fatty oil (20%) was found in the seeds.

### Conclusion

The oil is colorless, with a yellowish or greenish tint, a pleasant refreshing taste and smell. When settling, it thickens and darkens. The main component of the essential oil is the secondary alcohol l-menthol (45–92%). The leaf oil also contains menthol esters with acetic and valeric acids,  $\alpha$ - and  $\beta$ -pinene, limonene, dipentene, phellandrene, cineole, citral, geraniol, carvone, dihydrocarvone.

The unique aroma of mint leaves is given by the menthol contained in them. It is he who provides the mint drink with a refreshing taste. Essential oils of menthol facilitate breathing and relieve nasal congestion in case of colds. The high content of vitamin C in mint helps to strengthen the immune system and cope with the disease.

Mint leaves have a vasodilating effect, therefore they are indicated for hypertension, chronic headaches. Peppermint tea also cleanses blood vessels, activates the brain. Mint-based drinks have a beneficial effect on the functioning of the heart, improve blood circulation.

### References:

1. Chori Elmurodov, Foziljon Saitkulov, Burkhon Elmurodov, & Kuchkar Giyasov. (2023). Study of quinazoline-4-one methylation reaction and spectral analyses. *Galaxy International Interdisciplinary Research Journal*, 11(9), 310–314. Retrieved from <https://giirj.com/index.php/giirj/article/view/5570>
2. Saitkulov Foziljon Ergashevich, Anvarova Nafisa Yorqin qizi, Xolbo'tayeva Ruxshona Sodiqjon qizi, Xushboqova Feruza Davron qizi, & Egamnazarova Marjona Xatamqul qizi. (2023). Analysis of calcium cation in "amri" variety of melon. *journal of science, research and teaching*, 2(11), 119–122. Retrieved from
3. <http://jsrt.innovascience.uz/index.php/jsrt/article/view/331>
4. Sapayev, B., Saitkulov, F. E., Normurodov, O. U., Haydarov, G., & Ergashyev, B. (2023). Studying Complex Compounds of Cobalt (II)-Chloride Geocrystallohydrate with Acetamide and Making Refractory Fabrics from Them.
5. Насимов, Х., Рузиев, Э., Сaitкулов, Ф., & Баймуратова, Г. (2023). Спортивная биохимия в жизни человека. *Евразийский журнал технологий и инноваций*, 1(7), 31–34. извлечено от <https://www.in-academy.uz/index.php/ejti/article/view/18807>
6. Umarov, M., & Islamova, Y. (2023). Chloracylation of carbazole. *Академические исследования в современной науке*, 2(15), 184–188.
7. Lutfullaeva, A., Rakhmonova, I., Nasimov, H., Saitkulov, F., & Kuvatbay, K. D. (2023). Analysis of esters by physical research methods. *Development and innovations in science*, 2(6), 11–16.
8. Olimboyev, R., & Saitkulov, F. (2023). Banana peel fertilizer for house plants. *Innovative research in modern education*, 1(1), 19–22.
9. Shoyimovich, K. G., Murodillayevich, K. M., Umurzkhovich, T. M., Sharafiddin o'g'li, A. S., & Ergashevich, S. F. (2023). Chromatography-Mass Spectrometry in Modern Physical Research Methods. *Eurasian Journal of Physics, Chemistry and Mathematics*, 16, 72–74.

10. Azamatova, M., Meliyeva, S., Azamova, S., Sapaev, B., & Saitkulov, F. (2023). Healing properties of chamomile. *Академические исследования в современной науке*, 2(8), 37-40.
11. Azamova, S., Meliyeva, S., Azamatova, M., Sapaev, B., & Saitkulov, F. (2023). Methods of obtaining uzbek chamomile extract (*matricaria chamomilla*). *Theoretical Aspects in the Formation of Pedagogical Sciences*, 2(7), 53–57. извлечено от
12. <http://www.econferences.ru/index.php/tafps/article/view/5038>
13. Amirova, N., Qulmaxamatova, D., Bebitova, K., Saitkulov, F., & Nasimov, K. (2023). Technology of creating cool beverages rich in vitamins based on rose hip fruit. *Theoretical Aspects in the Formation of Pedagogical Sciences*, 2(5), 169–172. извлечено от
14. <http://econferences.ru/index.php/tafps/article/view/4581>
15. Saitkulov, F., Azimov, I., Ergasheva, M., & Jo'raqulov, H. (2022). Carbohydrates are the main source of energy in the body. *Solution of social problems in management and economy*, 1(7), 68-71.
16. Saitkulov, F., Ahmatov, I., Meliboyeva, F., Saydaxmatova, D., & Turopova, S. (2022). Titrimetric analysis of calcium cation in "obi navvot" variety of melon. *Академические исследования в современной науке*, 1(19), 302-304.
17. Saitkulov, F., Elmuradov, B., Giyasov, K., Ruziboev, D., & Sultonova, S. (2023). Efficient synthesis and direction of methylation of 2-methylquinazoline-4(3h)-thione. *Theoretical Aspects in the Formation of Pedagogical Sciences*, 2(10), 22–26. извлечено от
18. <http://www.econferences.ru/index.php/tafps/article/view/6273>
19. Saitkulov, F., Ibragimov, B. R., Allaqulova, M., Umarov, S., & Xolmatova, M. (2022). The role in the plant and the functions of nutrients. *Инновационные исследования в науке*, 1(16), 29-31.
20. Saitkulov, F., Farhodov, O., Olisheva, M., Sapparboyeva, S., & Azimova, U. (2022). Chemical feeding method of lemon plant using leaf stomata. *Академические исследования в современной науке*, 1(17), 274-277.