
# METHOD OF OBTAINING HERBAL MINT EXTRACT

**Kholmirzaev Mekhroj Murodillayevich**
**Khaydarov Gayrat Shoyimovich**
**Saitkulov Foziljon Ergashevich**
Uzbekistan-Finland Pedagogical Institute, Faculty of Natural and Physical Culture, Department of Natural Sciences
Tashkent State Agrarian University
https://doi.org/10.5281/zenodo.7567666

Annotation: This paper shows the ethanol extract of mint. The method provides for water-enzymatic extraction of crushed vegetable raw materials. Vegetable raw materials are crushed to a size of 2-5 mm. Mint leaves are used as raw materials. The invention makes it possible to increase the yield of extractive substances from plant raw materials and increase the content of antioxidant substances in extracts.
Key words: ethanol extract of mint, the method, enzymatic extraction of crushed, raw materials, Mint leaves, extractive substances from plant raw materials, increase the content of antioxidant substances in extracts.

INTRODUCTION

The invention relates to the food industry, namely to methods for obtaining plant extracts with a high yield of extractive and antioxidant (polyphenolic) substances that can be used for the preparation of soft drinks, juice products, as well as in the production of confectionery.

The problem of obtaining products enriched with natural antioxidant substances, including polyphenolic compounds, is urgent. These substances protect the human body from free radicals - provocateurs of oncological diseases, diseases of the cardiovascular system, aging processes of the body. A significant content of polyphenolic substances is contained in medicinal and technical raw materials.

METHOD AND RESULTS

From the state of the art, various methods of obtaining extracts from plant raw materials are known, which differ in the nature of the extracting (water, water-alcohol mixture, whey, liquefied gases), methods of physical exposure (microwave treatment, ultrasound).

One of the known methods is a method for obtaining an extract from plant raw materials (nettle leaves, dandelion roots and burdock) including extraction with water at a temperature of 95-100°C for 45-60 minutes.

The disadvantage of the method is a single extraction of raw materials with water, increased temperature and duration of extraction, which reduce the stability of biologically active substances, and a single extraction does not make it possible to obtain an optimal yield of extractives[1-10].

A method for obtaining plant extracts for the production of soft drinks is also known, including water-enzymatic processing of vegetable raw materials crushed to a particle size of 5-10 mm for 2 hours at a temperature of 40-45°C and pH 4.5-5.0. Then the extraction is carried out with an aqueous alcohol solution of 20% concentration in two stages: stage 1 - the extraction process is 10-12 hours, stage 2 - 4-6 hours with periodic stirring for 5 minutes every two hours. As an enzyme preparation, it is used in an industrial setting. The disadvantage of the method is the use of alcohol, which, on the one hand, limits the amount of dosing of plant extracts in soft drinks, and on the other hand, alcohol is undesirable in the

composition of beverages that are consumed in large quantities by children. In addition, the disadvantage of the method is the duration of the extraction process.

The closest technical solution to the proposed method is a method for obtaining a plant extract with a high yield of selenium and biologically active substances. The method includes grinding vegetable mint to a particle size of 5-8 mm, water-enzymatic extraction of a mixture of raw materials with proteolytic and cellulolytic enzymes at a temperature of 50°C for 3 hours.

The disadvantage of the method is the use of two expensive enzyme preparations, a single extraction process and a sufficiently large grinding of raw materials (5-8 mm), which does not ensure maximum extraction of extractive and antioxidant substances from raw materials.

The objective of the invention is to develop a cheaper method for obtaining plant extracts with an increased yield of extractive and antioxidant substances from plant raw materials.

The task is solved due to the fact that in the method of obtaining plant extracts, including water-enzymatic extraction of crushed plant raw materials, water extraction is carried out in two stages, and enzymatic treatment is carried out only at the second stage of extraction with one cytolytic enzyme preparation ViscoStar, St. John's lemon balm, mint, birch leaves and plantain are used as raw materials in addition, vegetable raw materials are crushed to a size of 2-5 mm.

The technical results of the proposed method are:

- a cheaper way to obtain plant extracts from St. John's wort, lemon balm, mint, birch leaves and plantain with a high content of antioxidants;
- increasing the yield of extractive substances from the above-mentioned plant raw materials;
- increasing the content of antioxidant substances (polyphenolic compounds) in extracts.

THE EXPERIMENTAL PART

Technical results are achieved by the fact that dry vegetable raw materials from St. John's mint, plantain leaves and birch leaves are crushed to a particle size of 2-5 mm and extraction is carried out in two stages: at the first stage at a temperature of 85 °C for 15 minutes with the separation of the liquid part; at the second stage, water-enzymatic extraction is carried out the remaining solid part with one cytolytic enzyme preparation ViscoStar at a temperature of 55 °C for 3 hours with stirring every 20 minutes and followed by separation of the liquid part. Extracts of the first and second plums are combined and filtered.

The proposed method differs from the known one in that the aqueous extraction of the used plant raw materials is carried out twice, only one cytolytic enzyme preparation ViscoStar is used, water-enzymatic extraction is carried out at the second stage, and the grinding of raw materials is carried out to smaller particles (2-5 mm). From the above, it can be assumed that extraction carried out twice with a higher degree of grinding of raw materials will allow more complete extraction of extractive and antioxidant substances from plant raw materials, and the use of only one expensive enzyme preparation will allow the proposed method of obtaining plant extracts to reduce the cost.

The ratio of raw materials : extractant (water) at the first extraction is 1:15 (mint 1:20), at the second - 1:8 (mint 1:10).

ViscoStar was used as an enzyme preparation of cytolytic action. The enzyme preparation hydrolyzes insoluble high-molecular substances (hemicelluloses, cellulose, etc.) of plant raw materials to low-molecular soluble compounds (xylose, arabinose, etc.), destroys the cellular

structure of raw materials and thereby contributes to the additional extraction of substances from raw materials, including antioxidant.

The yield of extractive substances in the extract after enzymatic treatment increases on average by 1.4-1.7 times, polyphenolic compounds - by 1.23-1.33 times. The total content of extractives in finished extracts using an enzyme preparation increases on average by 1.23-1.25 times, polyphenolic compounds - by 1.15-1.23 times.

Example of method execution. Dry vegetable raw materials: St. John's wort grass, lemon balm, mint, birch and plantain leaves, crushed to a particle size of 2-5 mm and each separately filled with water at a temperature of 85 ° C in a ratio of 1:15 (mint 1:20). Extraction of raw materials is carried out at the same temperature for 15 minutes and stirring every 5 minutes. Then cooled to room temperature for 45-60 minutes . After cooling, the liquid part is separated (the first drain) from solid by decanting. The solid part is re-filled with water at a temperature of 55 ° C in a ratio of 1: 8 (mint 1: 10), acidify the mixture with citric or other food acid to a pH of 5.5, add an enzyme preparation of cytolytic action ViscoStar in an amount of 0.01% to the mass of raw materials and carry out enzymatic treatment for 3 hours at a temperature of 55 °C and stirring every 20 minutes. Then the liquid part (the second drain) is separated from the solid by centrifugation. Extracts of the first and second plums are combined and filtered.

CONCLUSION

From this example, it can be seen that a cheaper method has been developed for obtaining plant extracts with an increased yield of extractive and antioxidant substances from plant raw materials. Thus, the task has been solved.

## References:

1.Саиткулов Ф. Э., Элмурадов Б. Ж. УФ-спектральные характеристики хиназолин-4-он и–тионов //Innovative developments and research in education international scientific-online conference. pp-10-12. – 2022.

2. Саиткулов Фозилжон Эргашевич, Гиясов Кучкар, Элмурадов Бурхон Жураевич МЕТИЛИРОВАНИЕ 2-МЕТИЛХИНАЗОЛИН-4-ОНА «МЯГКИМИ» И «ЖЕСТКИМИ» МЕТИЛИРУЮЩИМИ АГЕНТАМИ // Universum: химия и биология. 2022. №11-2 (101). URL: https://cyberleninka.ru/article/n/metilirovanie-2-metilhinazolin-4-ona-myagkimi-i-zhestkimi-metiliruyuschimi-agentami (дата обращения: 25.01.2023).

3.Saitkulov F. E., Elmuradov B. J., Sh N. Ropijonova. Methylation of quinazolin-4-one with" soft" and" hard" methylating agents //International Journal of Development and Public Policy| e-ISSN. – С. 2792-3991.

4.Kholmirzaev Mekhroj Murodillayevich, Khaydarov Gayrat Shoyimovich, Saitkulov Foziljon Ergashevich, Kholiqova Kamola O'tkir qizi, & Umarova Aziza Ikrom qizi. (2022). Chromoto-Mass Methods for Detecting Simple Esters in Chromatography-Mass Spectrometry Method. INTERNATIONAL JOURNAL OF BIOLOGICAL ENGINEERING AND AGRICULTURE, 1(6), 53–56. Retrieved from http://inter-publishing.com/index.php/IJBEA/article/view/762

5.Saitkulov F. et al. PREPARATION OF A MIXED COORDINATION COMPOUND COBALT-II NITRATE HEXAHYDRATE WITH QUINAZOLINE-4-ONE AND 3-INDOLYLACETIC ACID ON

"AMBER" PLANTS OF THE PHASEOLUS AUREUS VARIETY //Science and innovation in the education system. – 2023. – T. 2. – №. 1. – C. 81-87.
6.Saitkulov F. et al. STUDY OF THE EFFECT OF FERTILIZING ON GRAIN PRODUCTIVITY //Development and innovations in science. – 2022. – T. 1. – №. 17. – C. 32-35.
7.Saitkulov F. et al. RECOMMENDATIONS FOR THE USE OF FATS //Theoretical aspects in the formation of pedagogical sciences. – 2022. – T. 1. – №. 7. – C. 175-177.
8.Saitkulov F. et al. TITRIMETRIC ANALYSIS OF CALCIUM CATION IN" OBI NAVVOT" VARIETY OF MELON //Академические исследования в современной науке. – 2022. – T. 1. – №. 19. – C. 302-304.
9.Saitkulov F. et al. THE ROLE IN THE PLANT AND THE FUNCTIONS OF NUTRIENTS //Инновационные исследования в науке. – 2022. – T. 1. – №. 16. – C. 29-31.
10. Saitkulov F. et al. BIOCHEMICAL EFFECTS OF THE COORDINATION COMPOUND OF COBALT-II NITRATE QUINAZOLIN-4-ONE WITH 3-INDOLYL ACETIC ACID IN THE "AMBER" PLANTS GRADES PHASEOLUS AUREUS //Академические исследования в современной науке. – 2022. – T. 1. – №. 17. – C. 263-267.