

RESEARCH ARTICLE

Open Access

DETERMINATION OF THE AMOUNT OF POLYPHENOLS IN THE FOOD SUPPLEMENT "ASBOSIM" USED IN THE TREATMENT OF HYPERTENSION DISEASE

 I.R. Askarov

Doctor of Chemical Sciences, Professor, Chairman of the "TABOBAT" Academy of Uzbekistan, Uzbekistan

M.M.Mominjonov

Vice-Chairman of the "TABOBAT" Academy of Uzbekistan, Doctor of Chemical Sciences, Uzbekistan

L.K.Lutfullin

Professor of Department of Chemistry, Andijan State University, 170100, Andijan, Uzbekistan

O.N.Temirkhojayeva

Researcher, Department of Chemistry, Andijan State University, 170100, Andijan, Uzbekistan

Abstract

It is known that one of the diseases that are difficult to treat in modern medicine is an increase in blood pressure, i.e. hypertension. Hypertension is a pathology of the cardiovascular system, a complex disease characterized by an increase in arterial pressure, followed by organomorphological changes. Hypertension is mainly caused by constant nervousness, depression and stress, increased amount of adrenaline in the blood, alcohol consumption, excessive obesity and other factors. This disease is one of the main diseases that lead to complications such as myocardial infarction, stroke, heart attacks, and heart and kidney failure. The main symptoms of high blood pressure are headache, dizziness, ringing in the ears and heart failure. High blood pressure is more common in middle-aged and elderly people.

Keywords Polyphenols, determination, food supplement, asbosim, hypertension treatment, hypertension, antioxidants, quantification, bioactive compounds, health supplements, natural remedies.

INTRODUCTION

Taking into account the above, we developed a new biologically active food supplement called "Asbosim" based on plants such as saffron, ajwain,

and mint, which has the characteristics of effective treatment of hypertension and contains natural biologically active compounds. This food supplement was approved by the Ministry of

Health of the Republic of Uzbekistan and put into practice. This article presents the results of the research on determining the amount of polyphenols in the natural biologically active food supplement "Asbosim" [1-5].

The amount of water-soluble polyphenols in the plant was measured using an LC-40 Nexera Lite high-performance liquid chromatograph manufactured by Shimadzu, Japan [6-8].

Preparation of standard solutions. Solutions of gallic acid, rutin, and quercetin (100 mg/l) in the amount of 5 mg of each polyphenol were dissolved in methanol for 20 minutes in an ultrasonic bath and transferred to a 50 ml flask and brought to the line with methanol. Then, 2.5 ml of the solution was transferred to a 25 ml volumetric flask and brought to the flask line with 30% 0.25% aqueous solution of acetic acid and 70% acetonitrile. 1.5 ml of the resulting solution was filtered using a 0.45 µm syringe filter, poured into a vial and used for

analysis [6-10].

Preparation of sample extract. For the extraction of flavonoids, 1 g of the test sample was weighed with an accuracy of 0.01 g on a scale, placed in a 50 ml conical flask, and 25 ml of 96% ethanol was added. The mixture was extracted in an ultrasonic bath at 60 °C for 20 minutes. Then the mixture was cooled, filtered and made up to 25 ml with ethanol in a volumetric flask. 1.5 ml of the extract was filtered through a 0.45 µm syringe filter placed in a vial and used for analysis [10-17].

Determination of polyphenols. Standard solution, sample extract Shim pack GIST C18 (150 × 4.6 mm; 5 µm, Shimadzu, Japan) reversed-phase column and isocratic (65:35) mobile phase was applied. The injection volume was 10 µL, the flow rate was 0.7 mL/min, and the column thermostat was set to room temperature. The analytical signal (peak area) of polyphenols was recorded at 254 nm (Figure 1).

mAU

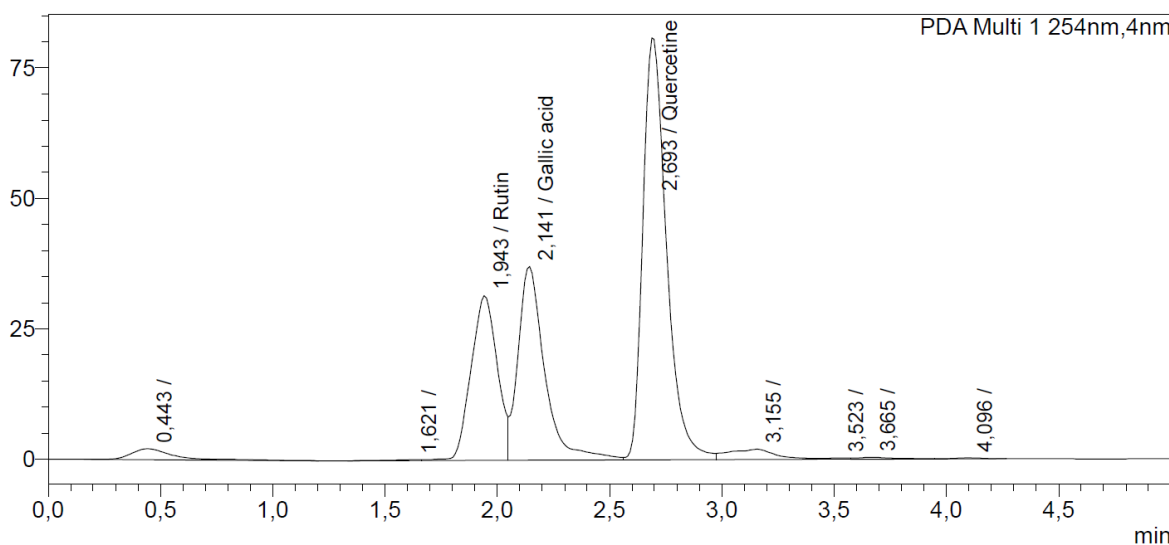


Figure 1. The chromatogram at 254 nm of rutin, gallic acid, and quercetin standards.

Determination of polyphenols in food in the extract of Asbosim FS. A chromatogram of the sample extract was obtained (Figure 2) and the results were processed and presented in Table 1.

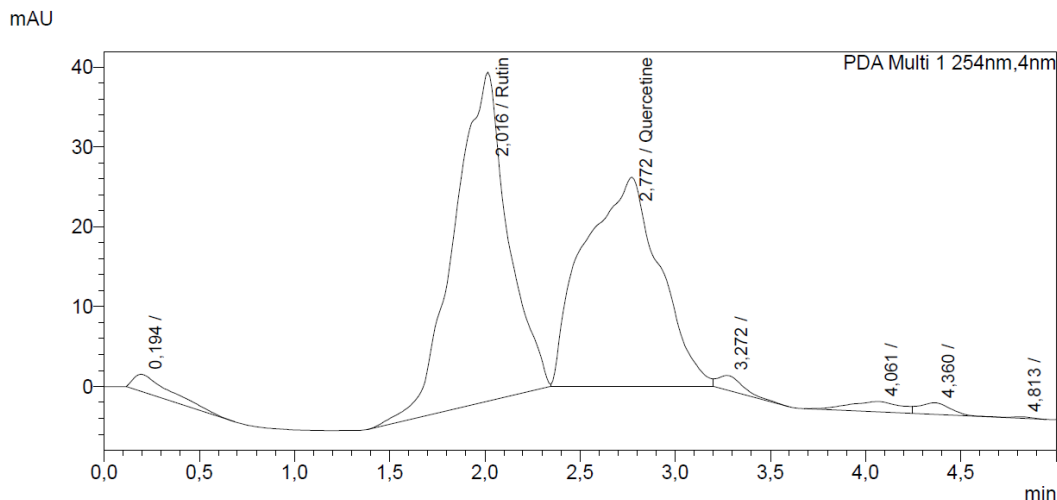


Figure-2. The chromatogram of determination of polyphenols in the sample extract.

Table 1. Amount and retention times of polyphenols in extracts.

Vitamin	Retention time, sec	Concentration, mg/l	The amount of sample extract in 100 g, mg
Rutin	2,016	35,79	894,75
Gallic acid	-	0	0
Quercetin	2,772	16,365	409,125

From Table 1 above, it can be seen that the amount of rutin (894.75 mg/100g) in the food supplement "Asbosim" is significantly higher than others. Also, it is known from the above table that the amount of quercetin in "Asbosim" is significantly high and that there is no gallic acid.

It is known that polyphenols such as rutin and quercetin normalize metabolism in the body and are one of the means of treating blood pressure. Studies conducted in this regard have shown that the effect of rutin and quercetin in normalizing systolic and diastolic blood pressure is high. This is a great scientific reason to say that "Asbosim" natural food additive contains a large amount of

rutin and quercetin, which shows high biological activity in the treatment and prevention of hypertension.

CONCLUSION

In conclusion, the natural food supplement "Asbosim" that we developed based on medicinal plants contains rutin and quercetin polyphenols. Among them, the amount of rutin is significantly higher than others, which gives this food supplement the property of treating and preventing hypertension. Taking into account the above scientific results, people suffering from hypertension are recommended to use the biologically active food supplement "Asbosim"

instead of synthetic drugs.

REFERENCES

1. Жолондз, М. Я. Новый взгляд на гипертонию : Причины и лечение. — М. : Питер, 2011. — С. 192. — ISBN 978-5-49807-882-3.
2. Рубин А. Л. Гипертония для «чайников» = High Blood Pressure For Dummies. — М.: «Диалектика», 2007. — С. 496. — ISBN 0-7645-5424-7
3. Askarov, I.R. Tabobat qomusi. T.: "Mumtoz soz". – 2019. – B. 1142.
4. Askarov, I.R. Sirli tabobat. – T.: Fan va texnologiyalar nashriyot-matbaa uyi. 2021. – B. 1084.
5. <https://www.ncbi.nlm.nih.gov/books/NBK538510/#:~:text=There%20are%20nine%20water%2Dsoluble,in%20severe%20morbidity%20and%20mortality.>
6. https://borderlessaccess.com/ba-health?utm_source
7. <https://www.northdata.com/DSM+Nutritional+Products+GmbH,+Grenzach-Wyhlen/Amtsgericht+Freiburg+HRB+413176>
8. Dong, M. (2019). New HPLC Systems and Related Products Introduced in 2018–2019: A Brief Review. LCGC North America, 37(4), 252-259.
9. Mamarakhmonov, M. K., Belen' kii, L. I., Chuvylkin, N. D., & Askarov, I. R. (2017). Quantum chemical study of ferrocene derivatives 2. Arylation reactions with aminophenols. Russian Chemical Bulletin, 66, 724-726.
10. Mamarakhmonov, M. K., Belen' kii, L. I., Djurayev, A. M., Chuvylkin, N. D., & Askarov, I. R. (2017). Quantum chemical study of ferrocene derivatives 1. Arylation reactions with aminobenzoic acids. Russian Chemical Bulletin, 66, 721-723. [https://www.webofscience.com/wos/author/record/T-7751-2017.](https://www.webofscience.com/wos/author/record/T-7751-2017) DOI:10.1007/s11172-017-1800-1
11. https://www.shimadzu.com/an/products/liquid-chromatography/hplcuhplc/nexera-series/index.html?utm_source=pdf&utm_medium=pdf&utm_content=ebook-
12. https://www.novatech-usa.com/OHA-30456410?gclid=EAlaIQobChMIhK64_rCLgMVDFCRBR3tRgKoEAAYASAAEgKCpFD_BwE
13. <https://www.google.co.uz/search?q=GT+S ONIC-D3+%28China%29&sca>
14. <https://www.ssi.shimadzu.com/products/hplc-components-accessories/hplcuhplc-detectors/photodiode-array-detector-spd-m40/index.html>
15. <https://www.shopshimadzu.com/product/s227-30017-07>
16. <https://www.mk.ru/social/health/2021/10/28/perechisleny-vozdeystviya-ot-priema-vitamina-s-dlya-lyudey-starshe-50-let.html>
17. <https://www.mk.ru/social/2021/12/09/nazvana-polza-vitamina-c-dlya-lyudey-s-gipertoniey.html>