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ANORNING MEVA PO‘STI TARKIBIDAGI VITAMINLAR MIQDORINI YSSXDA ANIQLASH VA ULARNI TAQQOSLASH

DETERMINATION OF THE AMOUNT OF VITAMINS CONTAINED IN POMEGRANATE PEEL AND THEIR COMPARISON

ОПРЕДЕЛЕНИЕ КОЛИЧЕСТВА ВИТАМИНОВ, СОДЕРЖАЩИХСЯ В КОРОЧКЕ ГРАНАТА, И ИХ СРАВНЕНИЕ

Hayatulla Isakov[1], Shokhrukh Odiljonovich Torakhanov[2], Ibrahimjon Rahmonovich Askarov[3]

[1]Hayatulla Isakov – Andijan State University, Professor of the Department of Chemistry, Doctor of Technical Sciences

[2]Shokhrukh Odiljonovich Torakhanov – Andijan State University Doctoral student

[3]Ibrahimjon Rahmonovich Askarov – Andijan State University, Professor of the Department of Chemistry, Honored Inventor of Uzbekistan, Chairman of the Academy of Medicine of Uzbekistan

Annotatsiya

Tadqiqotning maqsadi anorning Tuyatish va Qayin navlari meva po‘sti tarkibidagi vitaminlarni aniqlash va ularning mg miqdorlarlari o‘rganish. YSSX (Yuqori samarali suyuqlik xromatogramma)sida vitaminlar miqdori aniqlandi. Natijalar Qayin anor meva po‘sti tarkibidagi vitaminlar miqdorini Tuyatish navli meva po‘sti tarkibidagi vitaminlarga taqqoslab o‘rganish natijalari keltirilgan. Tuyatish navi tarkibidagi vitaminlar miqdori Qayin navi tarkibidagi vitaminlaridan kamligi aniqlandi.

Аннотация

Цель исследования - определить витамины, содержащиеся в кожуре плодов граната сортов Туятиш и Каин, и изучить их количество в мг. Количество витаминов определяли с помощью ВЭЖХ (высокоэффективной жидкостной хроматограммы). Результаты. Представлены результаты сравнения количества витаминов, содержащихся в кожуре плодов граната, с содержанием витаминов в кожуре сорта Туятиш. Установлено, что количество витаминов в сорте Туятиш меньше, чем в сорте Каин.

Abstract

The purpose of the research is to determine the vitamins contained in the fruit peel of Tuyatish and Kain varieties of pomegranate and to study their mg amounts. The amount of vitamins was determined in HPLCH (High Performance Liquid Chromatogram). Results The results of comparing the amount of vitamins contained in the peel of the pomegranate fruit with the vitamins contained in the peel of the Tuyatish variety are presented. It was found that the amount of vitamins in the Tuyatish variety is less than the vitamins in the Birch variety.

Kalit so‘zlar: *Anor, anor mevasi po‘sti, Tuyatish va Qayin anor navlari vitaminlar B-12, B-9, B-2.*

Keywords: *Pomegranate, pomegranate peel, Tuyatish and Kain pomegranate varieties contain vitamins B-12, B-9, B-2.*

Ключевые слова: *Гранат, кожура граната, сорта граната Туятиш и Каин содержат витамины B-12, B-9, B-2.*

INTRODUCTION

Pomegranate (Punica granatum L.) is one of the varieties that have been used by people in folk medicine since ancient times due to the healing properties of its fruit, peel, seed, leaf, and body [1]. Pomegranate skin, seeds, and fruit are rich in antioxidants [2]. Currently, it is used for long-term storage of packaged food products, for dyeing, in folk medicine for gastrointestinal diseases, oral cavity diseases, diarrhea, gum treatment, and cancer treatment [3].

MATERIALS AND METHODS

Various varieties of pomegranates grown in Uzbekistan are being studied. Their composition is rich in organic and inorganic substances, especially the birch and tuyatish varieties of pomegranate are of particular importance. These varieties contain amino acids, macro-microelements, carbohydrates, tannins and other organic substances as well as vitamins [2]. Vitamins play an important role in the growth and development of muscles, tendons, and tissues of

the human body, in metabolism, and in providing the body with oxygen[1,3]. For example, vitamin B-12 is an important nutrient that the body needs to optimize the brain and nervous system[4]. However, despite its importance, people around the world suffer from a deficiency of this essential nutrient[5]. For the human body, vitamin B-12 deficiency can cause anemia, memory problems and depression, abnormal platelet count (low platelet count or high platelet count), fatigue, hallucinations and confusion, insomnia, disorientation in space, loss of smell and memory[6]. An important source of vitamin B-12 is food, meat, poultry, fish, eggs and dairy products, blue-green algae, drugs that reduce the acidity of gastric juice - omeprazole (Prilosec), pantoprazole (Protonix), esomeprazole (Nexium), ranitidine (Zantac), and famotidine (Pepcid), Diabetic drugs - Metformin reduces the absorption of vitamin B-12[7,8].

Vitamin B-9 (folic acid) is a water-soluble vitamin necessary for the synthesis of DNA and some amino acids (glycine, methionine). It was first isolated from spinach leaves[9]. Vitamin B-9 enters the body with food. It is found in beans, parsley, lettuce, cabbage, tomatoes, spinach, asparagus, liver, kidney, meat, mushrooms, yeast and is destroyed at high temperatures. Part of this vitamin is produced by intestinal microflora in the presence of para-aminobenzoic acid[10]. In addition, the liver and kidneys have folacin reserves, which can compensate for its insufficient intake for several months. B-9 is absorbed in the small intestine: in its mucous membrane, biochemical changes of the vitamin occur with the formation of active forms that can pass into the blood and participate in biochemical reactions. Its role in the body is its ability to carry a methyl residue (CH3-) - this is the reaction in which DNA and some amino acids (glycine, methionine) are formed. With hypovitaminosis, DNA synthesis slows down and abnormal DNA appears, which is easily broken due to substitution of thymine nucleotides with uridine. With such a disorder, the cells and tissues that are often renewed are affected first of all, blood and epithelium - this determines the symptoms of hypovitaminosis of folic acid[9,10]. Megaloblastic anemia develops, which is manifested by pallor, weakness, fatigue, typical cells are seen in the blood test. In addition, the number of other blood elements - platelets and leukocytes decreases and their abnormal forms appear. Adequate levels of folic acid in the body reduce the risk of developing cancer. Excess B-9 is unlikely because the water-soluble vitamin is excreted in the urine [10,11].

Riboflavin (vitamin B-2) is a water-soluble biologically active substance that is a coenzyme of many vital redox enzymes and participates in the metabolism of proteins, fats, and carbohydrates[12]. There are about 15 flavoproteins, which include riboflavin in the form of flavin mononucleotide (FMN) and flavin adenine dinucleotide (FAD). Flavin enzymes oxidize various acids, inactivate highly toxic aldehydes and foreign isomers of amino acids. Vitamin B 2 enters the human body with food [13]. It is found in milk, greens, grains, liver, kidneys, vegetables, yeast, mushrooms, almonds[14].

RESULTS AND DISCUSSION.

High Performance Liquid Chromatography (HPLC) of water-soluble vitamins in Tuyatish and Birch varieties of pomegranate was performed on an Agilent Technologies 1200 chromatograph on an Exlipse XDB C18 column (reverse phase), 3.5 μm, 4.6x150 mm. Diode array detector (DAD), 254, 290 nm. Solution A: 0.5% acetic acid, pH 1.7: B:CH3CN (acetonitrile). The flow rate was 1 ml/min. Gradient % B/min: 0-5min/96:4%, 6-8min/90:30%, 9-15min/80:20%, 15-17min/96:4%. Thermostat 250C.Figures 1,2.

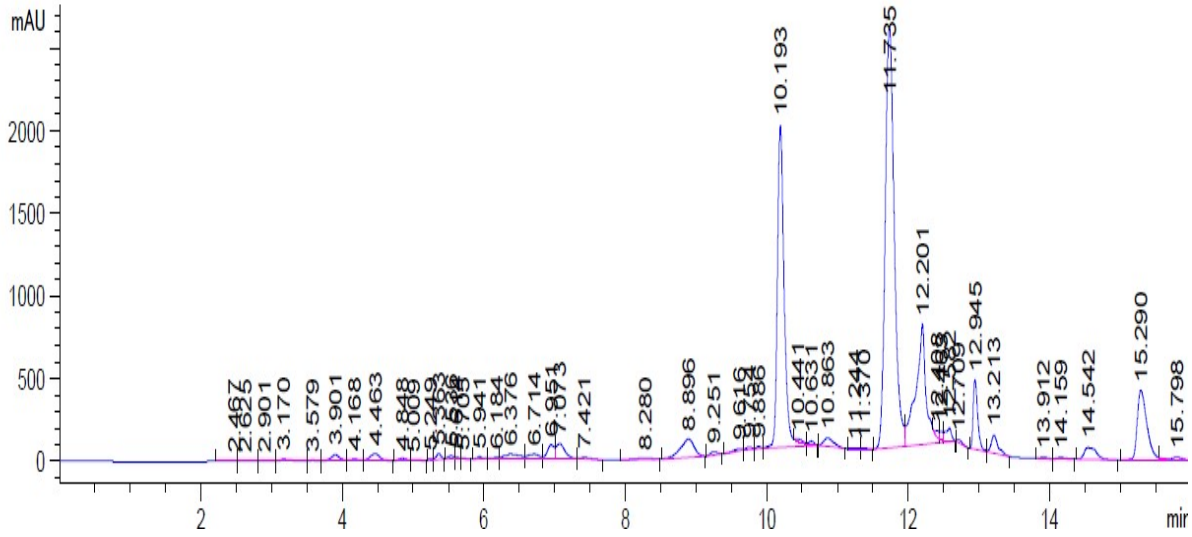


Figure 1. Summary of vitamins in the fruit skin of Tuyatish pomegranate variety

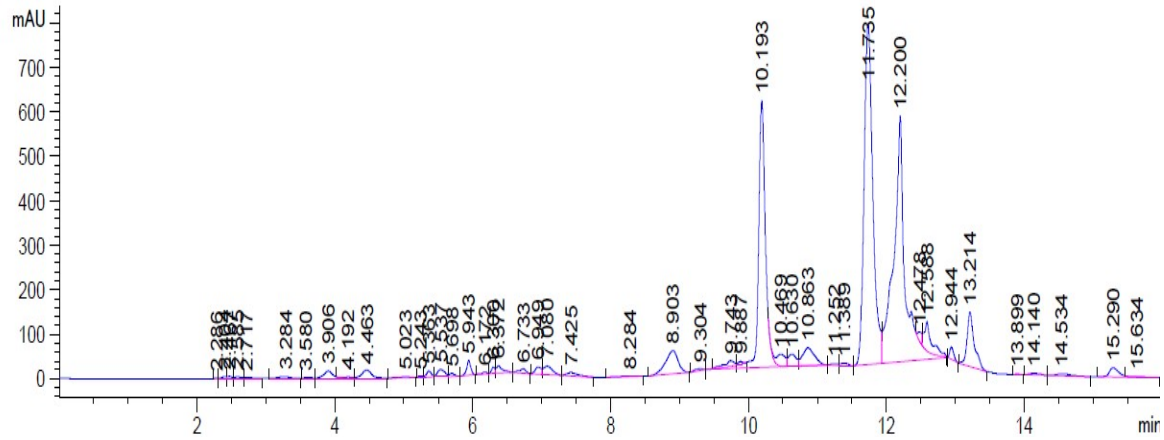


Figure 2. Summary of vitamins contained in the skin of the fruit of the Kain pomegranate variety

Vitamins in the samples taken from the peels of Tuyatish and Birch varieties of pomegranate were identified by comparing the column release times of standard vitamins, and their amounts were calculated by putting the relevant peak areas for vitamins in the chromatograms into Trend equations. The obtained results are shown in Table 1 below.

Table 1

Amounts of vitamins in mg/g of peels of Tuyatish and Kain varieties of pomegranate

3 №	Vitamins	Birch pomegranate peel	Appetizing pomegranate peel	Vitamins mg difference
		CONSENTRATE mg/gr		
1	B-1	0,701231	0,65	0.051231
2	B-2	13,07173	12,05	1.021730
3	B-6	2,921924	2,11	0.819240
4	B-9	16,6684	14,81	1.858400
5	B-12	156,7115	156,75	-0.038500
6	PP	0,444306	0,46	-0.015694
7	C	12,18372	9,31	2.87372

The obtained results, when we compared the vitamins in the peels of Tuyatish and Kain varieties of pomegranate, it was found that the amount of vitamin B-12 in both varieties is higher than the rest of the vitamins. When comparing the amount of vitamins, B-9 > B-2 > C > B-6, vitamin B-1 and vitamin PP are in the following places, and the amount of vitamins contained in the bark of the Birch pomegranate variety is higher than that of the fruit peel of the Tuyatish pomegranate variety. It was found that the amount of vitamins C > B-9 > B-2 > B-6 > B-1 is high. If we pay attention to the differences in the table, it was found that the amount of vitamin B-12 and PP contained in the peel of Tuyatish pomegranate variety is more than that of the peel of Kain pomegranate variety.

Summary.

Vitamin B-12 deficiency in the body is one of the most common types of beriberi. If the level of this vitamin is low, it is necessary to control the body during old age and birth control when taking medications such as pills and antidiabetic drugs. Most people with vitamin B-12 deficiency need supplements. To fill these deficiencies in the body, it is advisable to consume vitamins and food supplements made on the basis of pomegranate peel.

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