The American Journal of Engineering and Technology
(ISSN – 2689-0984)
VOLUME 04 ISSUE 02 Pages: 37-41
SJIF IMPACT FACTOR (2020: 5. 32) (2021: 5. 705)
OCLC – 1121105677 METADATA IF – 7.856
Publisher: The USA Journals

Journal Website: https://theamericanjournals.com/index.php/tajet

Research Article

THE CHEMICAL COMPOSITION, PROCESSING TECHNOLOGY AND IMPORTANCE OF ROSE HIPS IN THE PHARMACEUTICAL INDUSTRY

Submission Date: February 11, 2022, **Accepted Date:** February 18, 2022,
Published Date: February 28, 2022 |
Crossref doi: https://doi.org/10.37547/tajet/Volume04Issue02-07

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ABSTRACT

This article describes the types of medicinal rose hips, their biochemical properties, trace elements, chemical composition, use as a drug, its importance in human health, the technology of development of various products in the fruit processing industry.

KEYWORDS

Rose hips, tannins, pectin, citrine. riboflavin, tocopherol, jam, compote, ascorbic acid, Rosa malina, Rosa canina.

INTRODUCTION

In order to fulfill the priorities set by the Presidential Decree No. PP-4670 “On measures for protection, cultivation, processing of wild growing medicinal plants and rational use of available resources” and PQ-4901 from April 10, 2020 "On additional measures for the development of traditional medicine in the Republic of Uzbekistan" in The Namangan Institute of Engineering and Technology has been conducted a

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number of studies in 2020-2021 on the agrobiological properties of rose hips species, the study of the chemical composition of the fruit, its importance in the preparation of various medicinal canned products in the fruit processing industry.

In Uzbekistan, 6 out of 17 naturally occurring species of rose hips, cervitamine and fruits of large fruits are widely used in medicine. Rose hips (Rosa) belong to the family Rosaceae, which ranks first in the plant world for the amount of vitamin C in its fruit.

Rose hips fruits contain 6% gach vitamin C, vitamins B2, R, E and K, 12-27mg /% carotene, 29% organic (citric, malic) acids, up to 18% sugars, up to 3.7%, 4.5% tannins, and the seeds contain rose hips oil Amino acids are considered to have a wide range of pharmacological effects, affecting various organs and tissues, as well as participating in metabolic processes. Rose hips fruits contain 16 free and 18 bound amino acids, with a total content of 0.86% and 1.21%, respectively. Rose hips fruits contain from flavonoids: rutin, quercetin, isoquercetin. The highest percentage of routine occurrence was found in rose hips [7, 8, 9, 10]. Among the main anthocyanins, cyanidin-3-glucoside, pelargonidin-3, 5-glucoside and proanthocyanidins (B1, B2, B3, B4) were detected in rose hips species. Organic acids make up a large group and play a very important role in plant metabolism. They are intermediates in the oxidation of carbohydrates, fats, amino acids and proteins. Organic acids have a wide biological effect on the human body, are antiseptic, thirst-quenching, antioxidant [11, 12]. The plant is rich in ascorbic acid, and its content in fruits can reach up to 5.5% [13]. Triterpenes mainly accumulate in the leaves and roots of rose hips (ursolic acid derivatives). In addition, β - carotene, violaxanthin, anteraxanthin, zeaxanthin, rubixantin, lycopene, lutein were found in the fruit of the plant [14, 15]. Triterpenes mainly accumulate in the leaves and roots of rose hips (ursolic acid derivatives). In addition, β-carotene, violaxanthin, anteraxanthin, zeaxanthin, rubixantin, lycopene, lutein were found in the fruit of the plant [14, 15].

RESEARCH METHODOLOGY

From the general method adopted for conducting research in botany for research and methods of B.A. Dospexov, G.F. Lanin were used.

MAIN BODY

Object and subject of research - a number of districts of Namangan region, including Pop, Chust and Chartak districts, used naturally growing varieties of Rosa malina, Rosa canina and Begger (Rosa Beggeriana) (Fig. 1,2).

Fig.1. Rosa malina

For research, a total of 30 plants were selected from 10 bushes of each species, and their biometric indicators in the growth and development phases were determined. One kilogram of product was selected from three different varieties of rose hips, and their chemical composition, including ascorbic acid, additive, pectin, citrine, sugar content, tonoferola, was studied in the laboratory according to the methodology.

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Fig.2. Rosa canina

There are more than 400 species of rose hips plant in the world, of which more than 100 species are common. In our Republic, apple and rosehip species of rose hips are used as the main graft in the cultivation of ornamental plants and roses.

RESULTS AND DISCUSSIONS

According to the research, rose hips fruit contains an average of 11.2% of sugar, 4.0% of total acid, 4.4% of tannin and up to 2.7% of pectin, and the seeds contain 11.6% of fat. The fruit was found to contain ascorbic acid (vitamin C) - 3767, citrine (vitamin R) - 3300, riboflavin (vitamin V2) - 2.8 and tocopherol (vitamin E) - up to 0.75 mg %(Table 1).

Table1.

Chemical composition of rose hips fruit, (%) 2020-2021

Types	Sugar	Total Acid	Tannin	Pectin	Vitamins in 100 g of fruit, mg%				
					C	P	B_2	E	oils,%
Rosa malina	12.0	3.9	4.0	2.4	4000	3500	3.0	0.70	11.9
Rosa canina	11.4	4.0	4.4	2.8	3700	3000	2.9	0.80	12.0
Rosa beggeriana	10.2	4.1	4.7	2.9	3600	3400	2.6	0.76	11.0
Average amount	**11.2**	**4.0**	**4.4**	**2.7**	**3767**	**3300**	**2.8**	**0.75**	**11.6**

Rose hips fruit is included in the category of multivitamin plants that contain various vitamins. Rose hips fruits are effective in the treatment and prevention of avitaminosis. According to chemical analyzes, natural remedies made from rose hips can be used to stop bleeding, in removing congestion in the body, in the prevention and treatment of inflammation of the stomach and intestines. Carotene, an oily extract made from seed oils and fruit flesh, is used in the treatment of burns, eczema, X-rays and other skin diseases and in enhancing the body's immunity. The drug "Kholosas" made from the fruit is effective in the treatment of liver diseases (cholecystitis, hepatitis). Rose hips fruit contains salts of potassium, calcium, magnesium, phosphorus and sodium. Vitamin medicinal teas have been developed with the

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participation of rose hips, and they are successfully used in folk medicine [3,4].

Samples of jams, compotes and jams were prepared and technically tested at the "Billur Arkon" industrial enterprise in Chartak district, and a TM was developed for the products [5].

To make jam from rose hips, ripe fruits were sorted, they were cleaned of seeds, the peeled fruit was washed and dusted from the hairs. The fact that the sugar content of the product is 10-12% ensures its sweetness. The amount of sugar was determined according to the degree of acidity (Fig.3).

a b

Fig. 3. Rose hips's fruit: a – ripe fruit; 6- peeled fruit

It is desirable that the concentration of the sugar solution be between 35-40 [6]. The following formula was used to determine the concentration of the sugar solution: $\mathbf{K}=\frac{V1}{V2}\mathbf{x100}$. Here: K- fruit sugar content ratio; V^1- volume of sugary product after boiling; V^2- the initial volume of the product in water.

The following formula was used to determine the degree of sweetness of the product: $\mathbf{Db}=\frac{C}{K}$. Here: Db - the degree of sweetness of the product (score). C - the amount of sugar in the product (%). K - the amount of acid in the product (%). The sugar content of the baked product was found to be 12% and the acidity to be 4.0%. The Db-sweetness index of the product obtained for the preparation of jam was equal to 3 score, and it was determined that 350 grams of sugar should be added to one kilogram of product to make the concentration of the sugar solution -35%.

CONCLUSIONS AND RECOMMENDATIONS

Taking into account the chemical composition and properties of the fruit of the rose hips plant and its importance in human health, the following conclusions were drawn from the results of the study: Depending on the chemical properties of the fruits of the rose hips plant can be prepared various canned products in the industry. Rose hips can be used as an organic remedy for making jams, compotes, jams and dried bark from the fruit. In order to create a product base for the pharmaceutical and processing industries, conditionally irrigated areas are planted on a 4x3 m scheme. It is possible to grow 4-5 kg per bush and 3.5-4.0 tons per hectare.

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