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DETERMINATION OF ASCORBIC ACID CONTENT IN THE AERIAL PART OF ICELAND MOSS (CETRARIA ISLANDICA)

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KEYWORDS

Cetraria islandica, HPLC, UV detector, ascorbic acid, Iceland moss.

ABSTRACT

The content of ascorbic acid (vitamin C) in the aerial part of Cetraria islandica was determined. The study was carried out using the high-performance liquid chromatography (HPLC) method. The results demonstrated the presence of ascorbic acid in Cetraria islandica and indicated that it may serve as a source of vitamin C as a medicinal raw material. The findings of this study are of significant importance for recommending the use of this plant in the pharmaceutical, medical, and food industries.

Keywords: *Cetraria islandica*, HPLC, UV detector, ascorbic acid, Iceland moss.

Vitamins are organic compounds of various chemical structures that are essential for humans and animals. These compounds, which are required by the body in necessary and limited amounts, are involved in metabolic processes in tissues as part of enzyme molecules. The vitamin content in products constantly varies and often accumulates in maximum amounts in the aerial organs of plants during the flowering period.

Ascorbic acid (vitamin C) is a colorless crystalline substance that is highly soluble in water and poorly soluble in alcohol. Ascorbic acid can convert trivalent iron into divalent iron, thereby facilitating the absorption of iron and calcium. It is one of the most effective antioxidants and restores the balance of antioxidants. Ascorbic acid plays an important role in the formation of immunity, protects the body from infections, increases the elasticity of blood vessel walls, and also contributes to skin elasticity, bone density, and collagen synthesis [3].

The amount of ascorbic acid in medicinal plants determines their pharmacological activity and value as a source of vitamins. Deficiency or excess of vitamin C in the body can lead to the development of various dangerous diseases. Vitamin C deficiency causes scurvy, which is characterized by bleeding gums, loosening of teeth, and internal bleeding. Excessive intake of vitamin C can lead to hypervitaminosis C, manifested by headaches, fatigue, insomnia, and short-term increases in blood glucose levels. To prevent such conditions, it is necessary to include vitamin C-rich foods in the daily diet in appropriate amounts.

The aim of this study was to determine the ascorbic acid content in *Cetraria islandica* using the high-performance liquid chromatography (HPLC) method and to analyze the obtained results.

Object of study.

The aerial part of *Cetraria islandica* grown in the Bostanliq district of Tashkent region.

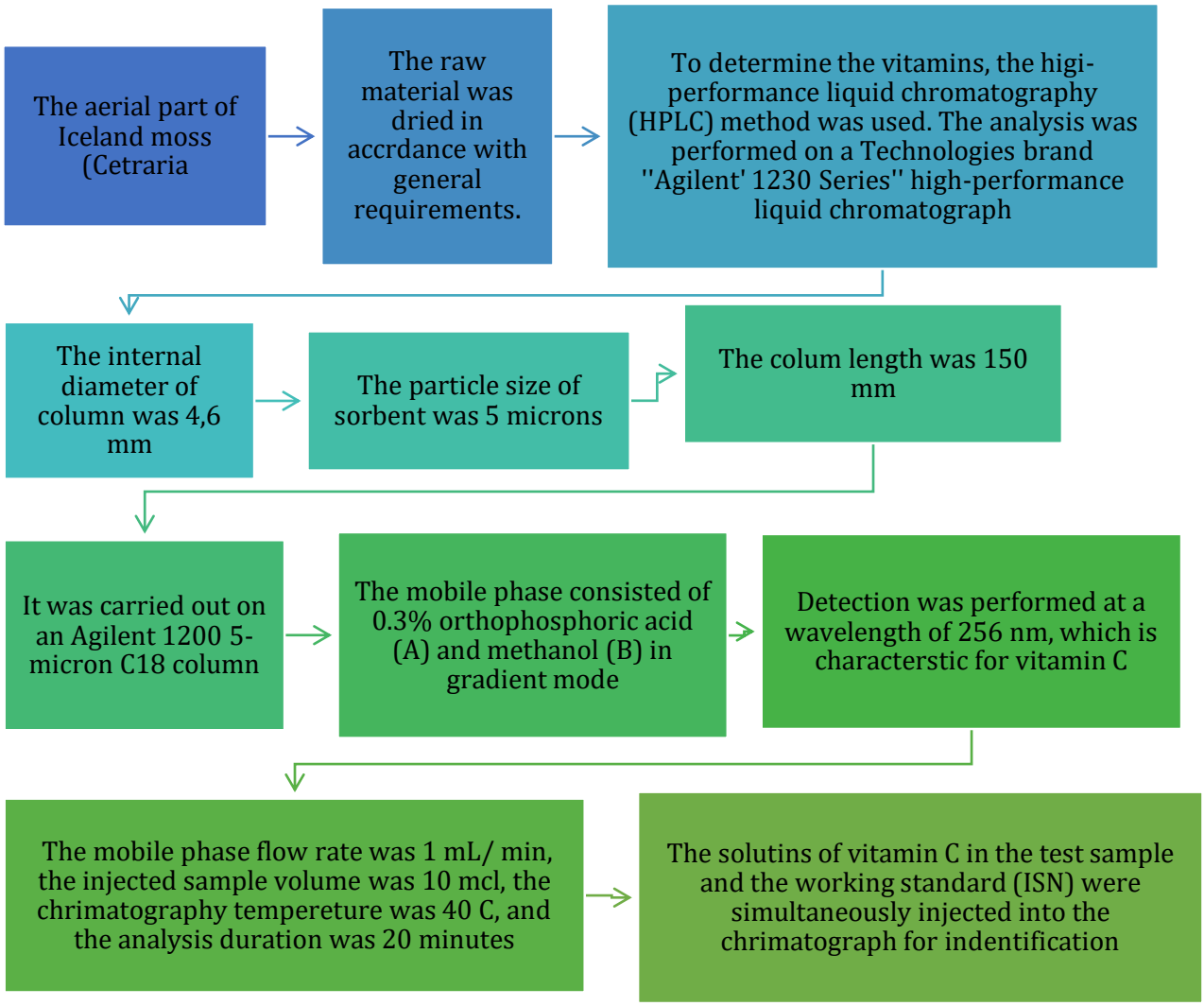
Preparation of the test solution.

For this purpose, 500 mg of the sample was accurately weighed and placed into a 100 mL volumetric flask. Then, 60 mL of 96% methanol was added, mixed thoroughly, and the volume was adjusted to the mark with the same solvent.

Preparation of the ascorbic acid reference solution.

A total of 0.010 g of vitamin C (State Pharmacopoeia of the Republic of Uzbekistan) was dissolved in 96% methanol in a 100 mL volumetric flask and diluted to the mark with the same solvent.

Materials and Equipment



Results and Discussion

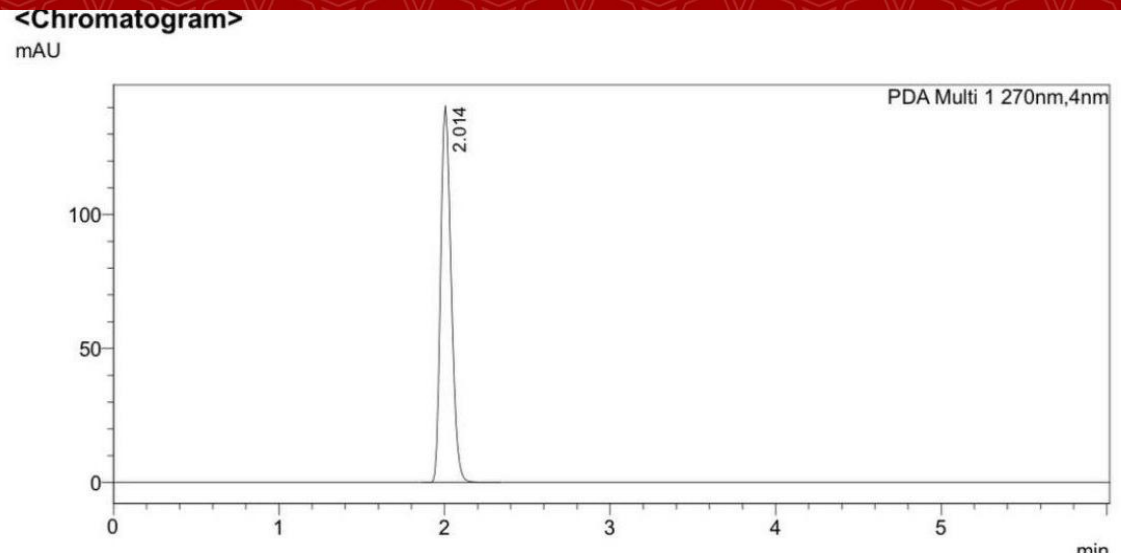


Figure 1. Chromatogram of the standard ascorbic acid solution.

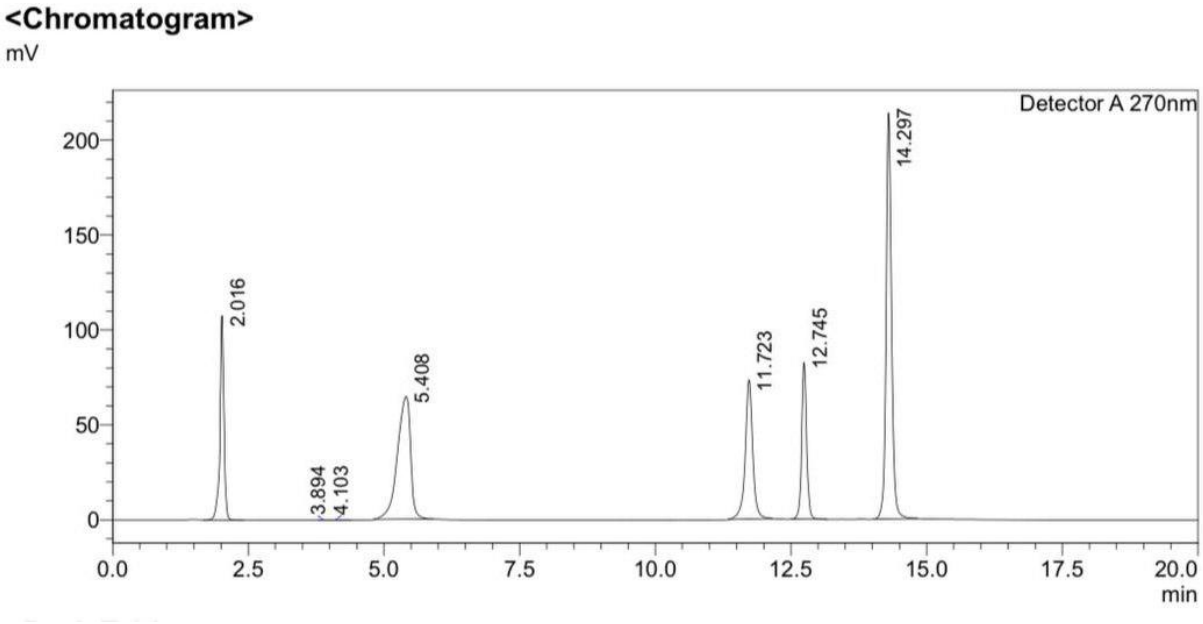


Figure 2. Chromatogram obtained for vitamin C in *Cetraria islandica*.

As shown in Figure 2, ascorbic acid in the aerial part of *Cetraria islandica* produced a characteristic chromatographic peak at a wavelength of 256 nm with a retention time of 2.016 minutes. The correspondence of this retention time with that of the working standard solution of ascorbic acid confirms the presence of ascorbic acid in the raw material.

Based on the obtained results, the determination of vitamins in the aerial part of *Cetraria islandica* using the high-performance liquid chromatography method was carried out in accordance with the State Pharmacopoeia standards, and both qualitative and quantitative parameters were studied.

Conclusion

Based on the obtained data, the presence of ascorbic acid in the raw material of *Cetraria islandica* was reliably determined using the high-performance liquid chromatography method.

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