

QUANTITATIVE DETERMINATION OF ASCORBIC ACID IN THE GRASS ACMELLA OLERACEA

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Introduction. Vitamins coming from food play a big role in the life of the body; they are not synthesized (or synthesized in insufficient quantities) and act as catalysts for metabolic processes. In particular, ascorbic acid strengthens the walls of blood vessels, increases the body's resistance to viruses and bacteria, improves the condition of connective tissue, and has a major role in metabolism and redox reactions. Ascorbic acid occurs in two forms (reduced and oxidized), both forms are biologically active.

In this regard, the study of the quantitative content of ascorbic acid in medicinal plant materials has a prerequisite for recommending it as a source of the vitamin. To date, no studies have been conducted to study the chemical composition of the herb acmella oleracea grown in the flora of Uzbekistan. The purpose of the work is the quantitative determination of ascorbic acid in the herb acmella oleracea by HPLC.

Materials and methods. The object of the study were samples of plant raw materials acmella oleracea (aerial part), prepared in the Botanical Garden named after F.I. Rusanova Academy of Sciences of the Republic of Uzbekistan (2023). The grass was collected during the flowering phase and dried in the shade. Dry medicinal raw materials were stored in hermetically sealed, light-proof jars in a dry, cool, dark place until analysis. Aqueous extracts (1:10) were prepared for analysis. The analysis of ascorbic acid was carried out using the HPLC method [5] on an Agilent Technologies 1200 (USA) chromatograph (Exlipse XDB column filled with reverse phase C18 sorbent, particle size - 5 μ m, diameter 4.6 mm, length 150 mm. Detector with a DAD-3000 diode matrix, length detector waves - 254 and 290 nm. During the experiments, a standard sample of ascorbic acid was used.

Chromatography conditions

Gradient	Time (min)	Mobile phase	
		% acetonitrile	% trichloroacetic acid
	0-5	96	4
	6-8	90	30
	9-15	80	20
	15-17	96	4
Injection volume	10 mkl		
Mobile phase flow rate	1ml/min		
Column thermostat temperature	30°C		

Preparation of a standard sample. To prepare a standard sample with a concentration of 0.05 mg/cm³, 5 mg of the standard is placed in a 100 cm³ volumetric flask and the volume is adjusted to the mark with methanol. Preparing the sample for analysis. A 1.0 g sample of crushed herb of the test object was placed in a round-bottomed flask, 100 cm³ of 70% ethyl

alcohol and 2 ml of hydrochloric acid were added, and heated in a water bath with reflux for 1 hour. The solution was quantitatively transferred to a 100 cm³ volumetric flask and adjusted to the mark with 70% ethanol. Then the flask was placed in an ultrasonic bath for 5 minutes. The test sample was then filtered through a membrane filter and used for analysis. Calculation of the content of indicator components is carried out using a calibration schedule or using the formula:

$$x = \frac{C \times S_1 \times V}{S_2 \times m}$$

where: C is the concentration of the corresponding standard solution, mg/cm³;

S1 is the peak area of the determined component in the analyzed sample;

S2 is the peak area of the component being determined in the standard sample;

V is the total volume of sample dilution, cm³;

m is the mass of the sample, g.

Results and its discussion. A comparative analysis of the retention time of the standard (Fig. 1) and test (Fig. 2) samples showed the presence of ascorbic acid in the herb *acmella oleracea*.

Figure 1. Chromatogram of a standard solution of ascorbic acid

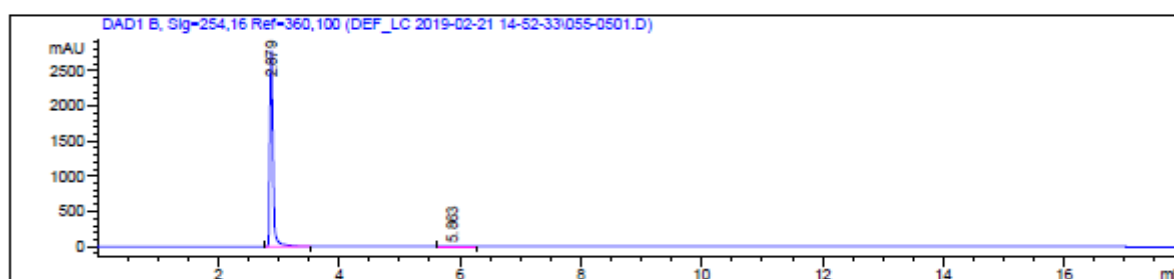
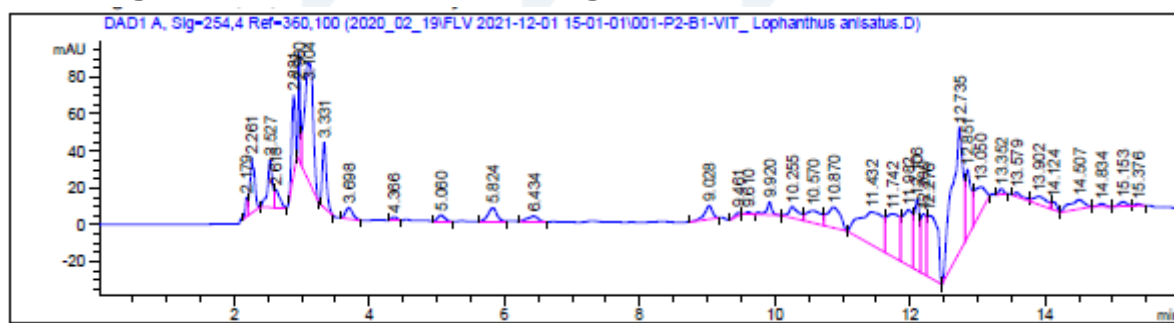


Figure 2. Ascorbic acid chromatogram of the herb *acmella oleracea*



The results obtained showed that the ascorbic acid content in the herb *acmella oleracea* is 3.18 mg/g (retention time 2.88 min).

Conclusions. For the first time, studies have been conducted to study ascorbic acid in the herb *acmella oleracea*, grown in the conditions of the Republic of Uzbekistan. Using the HPLC method, the quantitative content of ascorbic acid in the raw material of *acmella oleracea* was determined (3.18 mg/g). Further research was aimed at in-depth phytochemical research of domestic raw materials for its introduction into medical practice.