İNVESTİGATİON OF THE EFFEKT OF PRELİMİNARY ENZYMATİC TREATMENT ON SOME BİOLOGİCALLY ACTİVE COMPOUNDS AND ANTİOKSİDANT PROPERTİES OF BLACK ELDERBERRY AND HAWTHORN BERRIES

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At present, a possible and rational way to increase the biological value of food is its fortification at the expense of natural plant extracts of berries that grow in the forests of Azerbaijan. Due to the lack of data on the effectiveness of preliminary methods, including enzymatic processing of these berries, this work was carried out. When performing the work, standard and special research methods were used. It has been established that there is a tendency to increase the content of phenolic substances in extracts of berries with pre-treatment with enzyme preparations up to 1.35 times (black elderberry, Pectinex BE XXL) up to 1.41 times (hawthorn, Amylase AG 300 L.) compared with control samples. The content of flavonoids in both analyzed extracts increases from 1.41 times (black elderberry, Pectinex BE XXL) to 1.46 times (hawthorn, Amylase AG 300 L). The results of the conducted studies show the expediency of pre-treatment of the pulps of these berries with enzyme preparations.

Natural biologically active plant raw materials are especially attractive to food manufacturers, since they not only improve the appearance of food products, but also have biological activity and have a beneficial effect on the human body. A well-known source of biologically active food ingredients, including anthocyanin pigments, is a variety of berry raw materials, including wild berries - black elderberry (Sambucus nigra L.) and hawthorn (Crataegus monogyna subsp.), in a complex of synthesized bioactive polyphenolic compounds. From the point of view of the organization of industrial processing, interest in these types of raw materials is due to significant biological reserves, stable annual renewability.

Obviously, the development of an effective technology for processing berries opens up prospects for obtaining ingredients from black elderberry and hawthorn berries, which can be positioned as sources of natural, healthy, environmentally friendly food products and other biologically active substances of berries, the use of which in the production of food products will make it possible to give they not only have an

attractive appearance, but also endow them with properties that are beneficial for human health.

This research was carried out in the period from 2016-2022, at the educational and research laboratory of the Department of Engineering and Applied Sciences of the Azerbaijan State University of Economics.

The purpose of this work is the possibility of increasing the yield of extractives and antioxidant activity using preliminary enzymatic treatment of black elderberry and hawthorn berry pulp to create new or enrich existing food products due to the high bioactivity and bioavailability of the food components contained in them.

The studies were carried out in 3 parallel determinations, the results of quantitative analysis of the chemical composition of berries are presented as an average result and ± standard deviation.

Cornel berries of black elderberry (Sambucus nigra L.), hawthorn (Crataegus monogyna subsp.), growing in the territory of various economic regions of the Republic of Azerbaijan, were used as objects at different stages of the study.

In this work, we used the following enzyme preparations with pectolytic and gluconolytic effects: Pectinex BE XXL, Amylase AG 300 L (Novozymes, Denmark), Sellokyuks. - A (manufacturer - Sibbiopharm, Russia).

The total content of phenolic substances, flavonoids, anthocyanins, antiradical, antioxidant and reducing activities were determined by special methods described below. The total content of phenolic compounds in fruit and berry extracts was estimated using a modified version of the Folin-Chekolteu method. The total content of flavonoids in the extracts was measured using a modified method [7, p. 700-706]. Flavonoid content was expressed as mg catechin equivalents per 100 g dry weight.The results of analyzes of the antioxidant activity of fruit extracts are shown in the table. As can be seen from Table. there is a tendency to increase the content of phenolic substances in extracts of berries with pre-treatment with enzyme preparations from 1.35 times (black elderberry, Pectinex BE XXL) to 1.41 times (hawthorn, Amylase AG 300 L.) compared with control samples. The content of flavonoids in both analyzed extracts increased from 1.41 times (black elderberry, Pectinex BE XXL) to 1.46 times (hawthorn, Amylase AG 300 L.) compared with control samples.

The content of anthocyanins also increases in both analyzed samples from 1.43 times to 1.55 times.

The results of the conducted studies show the expediency of pre-treatment of the pulp of black elderberry and hawthorn berries with enzyme preparations. The most effective enzyme preparations are Pectinex BE XXL, followed by Amylase AG 300 L (Denmark) and Sellolyuks-A (RF).