

# **ADAPTATION OF EXTRACTION PARAMETERS OF PECTIN FROM APPLE RAW MATERIALS WITH APPLICATION OF SUCCINIC ACID**

**Kiselev D.O. Hrynyk I.V.**

*Institute of Horticulture of NAAS*

Recently, increasingly biopolymers of natural origin, which characterized by the maximum ability to bind heavy metal ions and radionuclides in connection with the deterioration of the environmental situation in the world, are becoming increasingly polarized. These types of substances includes pectins. Pectin substances are a group of polysugars of colloidal nature. In general, pectin substances are pectinates, pectins and protopectins. Pectins are polyelectrolytes and characterize by gel-forming and emulsifying properties. That is why it is understandable to actively search for new sources for the production of pectin.

At present, the Ukrainian processing industry does not produce pectin, due to the limited raw material and technical base. Classical pectin production technologies are outdated, non-energy-saving, and the quality of the final product did not meet international standards. On average, the total Ukrainian demand for pectin is approximately 3200 tons per year. The deficit of the specified product offset by imports, but its cost is considerably higher than that of production in Ukraine.

Today there are several sources for the production of pectin - molasses, sunflower baskets, apple and grape vinegar. Apple cuts characterized by a high content of pectin substances, which is why it is necessary to integrate pectin production in processing plants producing juices and NFCs in order to create low-waste complex enterprises that produce several types of products.

That is why the purpose of our work was to study and adapt the parameters of extraction of pectin substances from apple excrements.

For extraction of pectins used for weight loss of 280 g of dried apple extract. Weighed in solution of succinic acid, at a concentration of 1 to 4% for 6-12 hours. After acidic hydrolysis, pectin was precipitated with ethanol, concentrated and

filtered. Was used ethyl alcohol for drying. The resulting pectin homogenized to a powdered state.

From literature, it known that the depth of hydrolysis of extraction depends on many factors - temperature, pH of the medium, concentration of the hydrolyzing agent, hydromodule and the term of hydrolysis. Determination of optimal hydrolysis-extraction parameters was determined according to generally accepted methods.

The first stage of the study was to study the influence of the hydromodule on the depth of extraction of pectin from apple excrement. Investigated the seven combinations of the hydromodule, namely 1: 1, 1: 2, 1: 3, 1: 4, 1: 5, 1: 6 and 1: 7. With an increase in the ratio of "substrate: solution of succinic acid", the yield of pectin increases, but with an increase for substance more than 1: 4, the output of pectin emerged on the plateau. In addition, at higher dilutions there was a problem with concentration of the solution.

The next stage of the study was the study of pectins extraction characteristics at different concentrations of succinic acid. The obtained results indicate a significant contribute.

The third stage of the research was the study of pectins extraction characteristics at different concentrations of succinic acid. The obtained results indicate a significant contribution of succinic acid concentration to the yield of pectin extraction of succinic acid concentration to the yield of pectin extract

One of the important factors in the reaction of hydrolysis-extraction of pectin substances is the extraction time. This parameter should match the optimum during the production process and cause the highest yield of pectin substances at minimal cost. That is why research conducted on the effect of the extraction duration on the yield of pectin. Resultants of the research, it was found that the optimal production time for extraction of pectin substances from apple excrement is 10 hours. Observed, that during extraction for a long time, no significant changes in the yield of pectin.

Established, that when the temperature of the mixture increases, the degree of extraction of pectins substances increases, however, when the temperature is above 60 ° C, the qualitative parameters of the extracted product reduced.

Thus, it is possible to simulate the optimal conditions for the extraction of pectins substances under production conditions - the hydromodule in the ratio 1: 4, the extraction temperature is 60 C, the extraction time is 10 hours and the concentration of amber acid is 4%.

After obtaining dried pectin, its homogenization and analysis of physical and chemical properties carried out. Obtained product with particles in the size of 0.5-1.0 mm, had a slightly acidic taste, without foreign smells, light cream color. The degree of esterification of the obtained apple pectin is 68.9%.

The conducted studies have shown the possibility of obtaining high quality pectin from waste recycling products, which can be used in the pharmaceutical and food industries. The optimum parameters of the extraction phase of pectin substances with the use of a solution of amber acid are established. The adapted technique can be used to create a complex of low-waste processing enterprises specializing in the processing of apples.