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ISOLATION OF INULIN FROM GARLIC, CHICORY, JERUSALEM ARTICHOKE.

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Diabetes mellitus is a group of metabolic disorders characterized by hyperglycemia due to impaired insulin action due to impaired insulin secretion (type 1 diabetes mellitus) and/or reduced insulin tolerance (type 2 diabetes mellitus). Type 1 diabetes accounts for approximately 5% to 10%. Type 2 diabetes is much more spread, accounting for 90% to 95% of all types of diabetes.

Since the second type of diabetes is more spread than the first, we will consider how to extract from natural raw materials the substance inulin, which is an anticoagulant and has antidiabetic properties.

Inulin can be isolated from Jerusalem artichoke tubers, chicory roots and garlic bulbs. The content of inulin can be determined by the Ermakov method with some modifications, the amount of hydrolyzed inulin can be determined using thiobarbituric acid, and the extraction of low molecular weight carbohydrates can be carried out with 82% ethanol at 450°C for 15 min.

Jerusalem artichoke tubers were thoroughly washed and crushed. Distilled water (pH 6.5) was added in a ratio of 1:2 and filtered. Stirred continuously at 75°C for 30 minutes. In this case, the extract is colored. To do extract uncolored, 0.1% SO2 in the form of H2SO3 was added to the extraction water. In this case, extract lose his color and do not contain phenolic and protein compounds. Next, CaCO3 was added to the filtrate to pH – 11 with stirring, and the precipitate that formed was separated by centrifugation. The supernatant liquid with an inulin concentration of 10-12% was decolorized with activated carbon (10-15g of coal per 1 liter of liquid) at 70-75°C, stirring for 20-30 minutes. Then concentrated under vacuum to obtain a concentrate containing 50-55% solids. The concentrate was cooled and treated with 96% ethanol at a concentrate : ethanol ratio of 1:2. The resulting precipitate was filtered, washed with cold distilled water, and dried. The isolation of inulin from chicory roots and garlic bulbs was carried out according to the method described above.

The output of inulin when using Jerusalem artichoke tubers was 82%, when using chicory-18% and garlic-4.6%. Thus, the most preferred raw material for the production of inulin are Jerusalem artichoke tubers.

The main advantage of inulin is its natural origin. It is usually made from chicory, because its inulin content is about the same as in Jerusalem artichoke tubers, but in the laboratory its yield by this method will be higher. Inulin and its by-products are also used in the pharmaceutical industry.

Reference:

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