Aurica CHIRSANOVA
Dr., assoc. prof., Technical University of Moldova
https://orcid.org/0000-0002-1172-9900
E-mail: aurica.chirsanova@toap.utm.md

Sustainable valorization of jerusalem artichoke (*Helianthus tuberosus*)
Valorificare sustenabilă a topinamburului (Helianthus tuberosus)

Jerusalem artichoke (*Helianthus tuberosus*) is a tuberous plant with significant nutritional and functional potential due to its high content of inulin, dietary fiber, and bioactive compounds such as polyphenols and antioxidants. In the current context, where sustainability and innovation in the food industry are major priorities, Jerusalem artichoke represents a promising resource for the development of innovative and health-promoting food products. A major advantage of Jerusalem artichoke is its drought resistance, low requirement for costly agricultural inputs, and high productivity, which make it well suited for sustainable cultivation, including under the climatic conditions of the Republic of Moldova. In this country, valuable local cultivars exist that are currently underutilized, creating opportunities for local valorization and the development of innovative food products. The present study investigates sustainable processing methods for Jerusalem artichoke tubers aimed at maximizing the nutritional and functional properties of the resulting ingredients. The applied methods include controlled-temperature drying, controlled fermentation, and selective extraction of bioactive compounds. These technologies enable the production of powders, concentrates, and extracts that can be incorporated into various food products, such as functional bread, bakery products, functional beverages, and nutritional supplements. Preliminary results demonstrate that the incorporation of Jerusalem artichoke leads to an increased content of dietary fiber and bioactive compounds in the final products, thereby improving their nutritional and functional profile. At the same time, the valorization process is sustainable, reducing waste and enabling the full utilization of tubers, thus contributing to an environmentally friendly production model. The bioactive effects of Jerusalem artichoke include glycemic regulation, stimulation of the intestinal microbiota, and antioxidant activity, all of which are important for the development of value-added food products. The study confirms that Jerusalem artichoke can be transformed into a versatile and eco-friendly ingredient, offering innovation opportunities for the food industry while meeting consumer demand for healthy, functional, and sustainable products. Through the valorization of local cultivars from the Republic of Moldova, innovative food products can be developed that harness local potential and promote sustainable agriculture and the competitiveness of the local food industry.

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