

PROSPECTS OF APPLICATION OF PLANT EXTRACTS OF HYPERICUM PERFORATUM, MELILOTUS ALBUS AND PORTULACA OLERACEA IN THE FOOD INDUSTRY**Akhmetzhanova A.T.,***2nd year doctoral student**Kazakh Agrotechnical Research University named after S.Seifullin
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Astana city, Zhenis avenue, 62B***Abstract**

Currently, one of the priorities for the development of food biotechnology and nutritionology is the search for natural sources of biologically active substances capable of increasing the functional value of food and having a positive impact on human health. Special attention is paid to vegetable raw materials containing a wide range of antioxidant compounds that can neutralize free radicals, reduce oxidative stress and prevent the development of a number of chronic diseases. Among the promising plants with high biological activity, *Hypericum perforatum* (St. John's wort), *Melilotus albus* (white sweet clover) and *Portulaca oleracea* (garden purslane) are of particular interest.

Keywords: 1 Antioxidant activity, 2 secondary metabolites, 3 *Hypericum perforatum*, 4 *Melilotus albus*, 5 *Portulaca oleracea*, 6 plant extracts, 7 functional foods, 8 biologically active substances, 9 plant tissue culture.

The antioxidant activity of these plants is due to the presence of a complex of secondary metabolites, including phenolic compounds, flavonoids, organic acids, vitamins, and other biologically active substances. These compounds play an important role in the protective mechanisms of plants and are at the same time valuable components for the creation of functional foods, biologically active additives and pharmaceuticals [1-2].

Hypericum perforatum is one of the most studied medicinal plants rich in flavonoids, phenolic acids and other antioxidant substances. The plant contains rutin, quercetin, chlorogenic and caffeic acids, which have a pronounced ability to inhibit the processes of lipid peroxidation and neutralize reactive oxygen species. Due to the high content of antioxidants, St. John's wort extracts can be used as natural components of functional foods aimed at increasing the body's resistance to adverse environmental factors [3-4-5].

Melilotus albus is of interest as a source of coumarins, flavonoids, and phenolic compounds with antioxidant and anti-inflammatory properties. Biologically active substances of sweet clover are able to participate in the regulation of redox processes, reducing the damaging effect of free radicals on cellular structures. In addition, the presence of organic acids and minerals increases the nutritional value of plant raw materials and expands the possibilities of its use in functional food technologies [6-7].

Portulaca oleracea is characterized by a high content of vitamins, phenolic compounds, carotenoids and mineral elements. Of particular value are ascorbic acid, flavonoids and other antioxidant components that help protect cells from oxidative damage. Due to its unique chemical composition, purslane is considered as a promising source of natural antioxidants for food enrichment and the creation of new types of functional nutrition [8-9-10].

Modern biotechnological methods make it possible to obtain plant raw materials not only from natural

populations, but also using in vitro culture of plant tissues and cells. This approach ensures year-round biomass production, stability of the qualitative composition and the possibility of targeted regulation of the synthesis of secondary metabolites. The use of in vitro cultivation technologies for *Hypericum perforatum*, *Melilotus albus* and *Portulaca oleracea* opens up prospects for obtaining standardized sources of antioxidants regardless of climatic and seasonal factors. The practical application of extracts of the studied plants is primarily associated with the development of functional food products of a new generation. The inclusion of plant extracts in the composition of fermented milk products helps to increase their antioxidant activity, improve nutritional value and expand the range of physiologically significant properties. An additional advantage is the possibility of using natural antioxidants as an alternative to synthetic supplements, which corresponds to current trends in the development of the healthy nutrition industry [11-12-13].

Thus, *Hypericum perforatum*, *Melilotus albus* and *Portulaca oleracea* are promising sources of natural antioxidants with high potential for practical applications in the food industry, pharmaceuticals and biotechnology. The use of extracts of these plants contributes to the creation of functional products with increased biological value and preventive focus. Further research should be aimed at optimizing the methods of obtaining plant raw materials, studying the mechanisms of antioxidant action of biologically active compounds and developing innovative technologies for their use in food production. This work is part of project The research was carried out within the framework of the grant funding project Irn AR23489321 "Development of technology for functional dairy products obtained using secondary metabolites of plant raw materials grown in vitro"

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