



Fund “Nauka” Project № 25008 Resume – Competition-based Session 2025:

“Qualitative and quantitative identification of the amino acid composition of protein fractions in Bulgarian rice with a view to their use in food supplements”

Project leader: Prof. Svetlana Fotkova Georgieva, PhD

The aim of this project is to conduct a comprehensive study of the amino acid composition of different Bulgarian rice varieties using modern proteomic and biochemical methods. By identifying in detail the amino acid composition of protein fractions from Bulgarian rice, we will assess their potential for use in medical and functional foods. Dynamic monitoring of these parameters is important for the development of high-quality food products and nutraceuticals aimed at improving nutritional status and preventing socially significant diseases.

Aims – selection and collection of samples from different Bulgarian rice varieties. isolation, qualitative and quantitative identification of the amino acid composition of protein fractions using methods such as infrared spectrophotometry (IR) and ultra-performance liquid chromatography (UPLC). Analysis and statistical processing of the results obtained in order to determine correlations between the amino acid profile and its potential biological properties.

Materials and methods – chemical and biochemical processing of samples will be performed according to established laboratory protocols. UPLC and IR spectrophotometry will be used for the qualitative and quantitative determination of the amino acid composition of the protein fractions of Bulgarian rice, techniques that provide detailed characterization of proteins and their suitability for use in food supplements.

Expected results – obtaining detailed data on the amino acid and protein profile of Bulgarian rice varieties, identifying potentially bioactive proteins and assessing their role in medical and functional foods. The analysis will provide new opportunities for the application of Bulgarian rice in healthy nutrition and the development of functional food products with high added value.

Results of scientific and theoretical significance:

1. Generating new scientific data on the protein and amino acid profile of different varieties of Bulgarian rice using UPLC and infrared spectrophotometry;
2. Quantitative determination of the gluten fraction and its variability depending on factors such as variety;

3. Establishing the relationship between the protein composition of rice and its nutritional and functional properties, which will contribute to a better understanding of the biological activity of rice proteins;
4. Expanding knowledge about the applicability of various analytical methods in the study of rice proteins and evaluating their effectiveness.

Results with practical significance:

1. Data on the potential applications of different rice varieties in the development of nutraceuticals, functional foods, and dietary supplements;
2. Identification of high-protein rice varieties with potential for use in the formulation of foods intended for athletes, vegetarians, and people with specific dietary needs;
3. Creation of a database on the protein and amino acid composition of Bulgarian rice varieties, which will support their targeted application in the food and pharmaceutical industries;
4. Development of recommendations for improving the nutritional profile of rice;
5. Provision of scientifically based data on the possibilities for replacing gluten-containing ingredients with rice proteins in gluten-free food products.