



**Serbian Biochemical Society
Ninth Conference**

"Diversity in Biochemistry"

Proceedings

Serbian Biochemical Society

President: Marija Gavrović-Jankulović

Vice-president: Suzana Jovanović-Šanta

General Secretary: Milan Nikolić

Treasurer: Milica Popović

Organizing committee

Natalija Polović

Milan Nikolić

Milica Popović

Karla Ilić Đurđić

Dragana Robajac

Romana Masnikosa

Nataša Simin

Aleksandra Stefanović

Jelena Brkljačić

Isidora Protić-Rosić

Ana Simović

Snežana Spasić

Vladimir Mihailović

Ana Miltojević

Srđan Miletić

Scientific committee

Marija Gavrović-Jankulović

Mihajlo B. Spasić

Vesna Niketić

Ivan Spasojević

Dejana Mokranjac

Neda Mimica-Dukić

Snežana Đorđević

Suzana Jovanović-Šanta

Melita Vidaković

Snežana Marković

Olgica Nedić

Ivanka Karadžić

Vesna Spasojević-Kalimanovska

Tanja Ćirković Veličković

Ivan Gržetić

Goran Brajušković

Vesna Vučić

Niko Radulović

Proceedings

Editor: Ivan Spasojević

Cover design: Zoran Beloševac

Publisher: Faculty of Chemistry, Serbian Biochemical Society

Printed by: Colorgrafx, Belgrade

Serbian Biochemical Society
Ninth Conference
with international participation

University of Belgrade – Kolarac Endowment
14-16.11.2019. Belgrade, Serbia

“Diversity in Biochemistry”

***Bacillus* sp. isolated from Japanese food Nattō**

Kristina Joksimović^{1*}, Aleksandra Žerađanin², Jelena Avdalović², Srđan Miletić², Gordana Gojgić-Cvijović², Vladimir Bešković³

¹*Innovation center of the Faculty of Chemistry, University of Belgrade, Belgrade, Serbia*

²*Institute of Chemistry, Technology and Metallurgy, University of Belgrade*

³*Faculty of Chemistry, University of Belgrade*

**e-mail:kjoksimovic@chem.bg.ac.rs*

Nattō is a traditional Japanese dish made from fermented soybeans and is usually combined with soy sauce. It is very rich in vitamins, amino acids, proteins, sugars, fats, minerals and dietary fibres, and polypeptides consisting of 275 amino acid residues with anticoagulant, fibrinolytic, blood pressure lowering effects and antioxidant activity ¹. *Bacillus subtilisnatto* belongs to the *Bacillus subtilis* species, and it is the basis for the production of traditional Japanese food. Enzymes and proteins of this strain also show antithrombin effects similar to heparin, as well as antitumor activity. It has also been shown that *Bacillus subtilisnatto* contains a nattokinase, which exhibits a strong fibrinolytic activity and activates other fibrinolytic enzymes ². The microorganism was isolated from the Japanese speciality: 1 g of Nattō was added to 9 mL of saline, resuspended and incubated in an aqueous bath at 80°C. A dilution series (10⁻¹-10⁻⁹) was made from which 1 mL of culture was taken and seeded on Petri dish with nutrient agar (peptone 1, 15 g, meat extract, 3 g, sodium chloride, 5 g, dipotassium hydrogen phosphate, 0.3 g, agar, 18 g, distilled water, 1 L) and incubated at 28 °C. Pure, individual colonies were isolated by the method of exhaustion. The isolated microorganism was characterized by API 50 CHB/E tests and 16S rRNA gene sequencing. The results of the API 50 CHB/E test showed that the resulting microorganism belongs to the species *Bacillus subtilis* with a percentage of agreement of 99.9%, with literature. This was confirmed with 16S rRNA gene sequencing.

Acknowledgements

This study was supported by the Ministry of Education, Science and Technological Development, Republic of Serbia, Project No. III 43004.

References

1. Ho H, Nguyen H. Optimization of *Bacillus subtilis* Natto immobilization process on alginate – chitosan complex and its application for Natto kinase fermentation. *Int J Pharm* 2016;5:25-30.
2. Mani V, Ming LC. Tempeh and Other Fermented Soybean Products Rich in Isoflavones. In: Frias J, Martinez-Villaluenga C, Peñas E. (eds), *Fermented Foods in Health and Disease Prevention*. Academic Press, Colorado, 2017, pp 453-474.