

12th ESBP 2025

European Symposium on
Biopolymers



1st - 3rd October
Lisbon, Portugal

Book of Abstracts

1st – 3rd October 2025

Rectorate of Universidade NOVA de Lisboa

Lisbon, Portugal



Dear Participants,

We are thrilled to host you for an exciting gathering of experts, researchers, and industry professionals from around the world to participate in the **12th European Symposium on Biopolymers (ESBP 2025)**.

ESBP2025 is dedicated to advancing knowledge and fostering collaboration in the field of biopolymers. Throughout the conference, you'll have the opportunity to engage in insightful lectures, workshops, poster presentations, and scientific discussions, while also enjoying networking opportunities.

We hope you have a rewarding and inspiring experience. We also encourage you to take some time to explore the beautiful city of Lisbon, rich in culture and history.

Thank you for joining us, and we look forward to making ESBP2025 a memorable and impactful event together!

On behalf of the organizing committee,

Maria Reis

Organizing Committee

- Maria Ascensão Reis
- Filomena Freitas
- Bruno Marreiros;
- Cristiana Torres;
- Diana Araújo;
- Eliana Guarda;
- Joana Fradinho;
- João Pereira;
- Mariana Matos;
- Mónica Carvalheira;
- Nídia Lourenço;
- Patrícia Reis.



Scientific Committee

- Alan Werker, Promiko, Lomma, Sweden;
- Auxiliadora Prieto, CIB-CSIC, Spain;
- Dieter Jendrossek, University of Stuttgart, Germany;
- Etienne Paul, Université de Toulouse, France;
- Ipsita Roy, The University of Sheffield, UK;
- Jochen Schmid, University of Münster, Germany;
- Jose Lagarón, Iata-CSIC, Spain;
- Kevin O'Connor, UCD, Ireland;
- Manfred Zinn, HES-SO, Switzerland;
- Manuel Coimbra, Universidade de Aveiro, Portugal;
- Mariana Villano, Sapienza University of Rome, Italy;
- Martin Koller, University of Graz, Austria;
- Miguel Gama, Universidade do Minho, Portugal;
- Nathalie Gontard, INRAE, France;
- Robbert Kleerebezem, TUDELFT, Netherlands;
- Rui Oliveira, NOVAFCT, Portugal;
- Stanislav Obruča, Brno University of Technology, Czech Republic.

P77. Different Fractions of Proteins Derived from Invasive Crayfish Shell, Composition and Antioxidant Activity

Nevena Hromiš*¹, Senka Popović¹, Zorica Tomičić², Ivana Čabarkapa², Danijela Šuput¹ and Jovana Pantić¹

¹ Food Preservation Technologies, University of Novi Sad, Faculty of Technology Novi Sad, Bul. cara Lazara 1, 21000 Novi Sad, Serbia

² University of Novi Sad, Institute of Food Technology, 21000 Novi Sad, Bul. cara Lazara 1, Serbia

nevena.krkcic@uns.ac.rs

Crayfish shells contain a variety of proteins that are crucial for their structure, function, and color. The main proteins in the shell are cuticular proteins, chitin-binding proteins, mineral-associated proteins, and crustacyanin. These proteins work together to form a chitin-protein matrix, strengthen the exoskeleton, contribute to calcification, and provide coloration and protection [1-3].

In this study, the possibility of utilizing the shell of the invasive crayfish *Faxonius Lymosus*, caught in the part of the Danube River flowing through Serbia, was investigated. After removing the edible part of the crayfish meat, the shell was subjected to a chemical demineralization process followed by deproteinization using hydroxide and elevated temperature. From the extract, proteins were fractionally precipitated at pH 3.5; 4.5 and 5.1. The amino acid composition of these isolates was examined and their antioxidant activity was tested.

The total amino acid content (protein indicator) was 59.90 g/100 g for the isolate at pH 5.1, then 61.02 g/100 g for the isolate at pH 4.5 and 72.23 g/100 g for the isolate at pH 3.5. High content of glutamic and aspartic acid in all isolates can be related to chitin-binding proteins - because these acids often form negatively charged domains that bind to chitin or calcium. Increased content of aromatic amino acids (Phe, Tyr): Phe (5.13%), Tyr (3.63%) might have a role in pigment-binding proteins or proteins with a protective (antioxidant) role. Crustacyanin has a pH close to 4.5, but fragments and similar proteins can precipitate at pH 3,5.

Relatively high content of basic amino acids (Lys, Arg), Lys (3.95%), Arg (4.31%), His (2.69%) might be related to antimicrobial peptides that are present in the hemolymph and may remain in the shell after deproteinization.

The antioxidant activity of the isolates in the DPPH• scavenging ability test ranged from 68.9-71.7% at an isolate concentration of 2.5 g/ml, to 77.7-89.1% at a concentration of 7.5 g/ml. Similarly, in the ABTS test, the radical inhibition values ranged from 17.9-52.9% for the lower and 85.4-94.9% for the upper concentration.

The obtained results indicate a significant antioxidant activity of the protein fractions isolated from the shell of the crayfish in a concentration dependant manner. The pH 3.5 fraction is particularly noteworthy, showing the highest activity in both tests (ABTS and DPPH), which correlates with its highest content of total amino acids (TAA), especially aromatic (tyrosine, phenylalanine) and acidic amino acids (aspartate and glutamate), which are known to contribute to the elimination of free radicals.

References

[1] N. Hromiš, S. Popović, D. Šuput, J. Pantić, S. Rakita, Z. Tomičić, I. Čabarkapa, *Food and Feed Research* 51 (2024) 143-153.

[2] M. Kragh, L. Mølbak, S. O. Andersen, *Comparative Biochemistry and Physiology Part B: Biochemistry and Molecular Biology* 118 (1997) 147-154.

[3] C. Pan, X. Liang, S. Chen, F. Tao, X. Yang, J. Cen, *Food Chemistry* 327 (2020) 127079.

Acknowledgements

The research was supported by the Science Fund of the Republic of Serbia, Po.No. 7417, Reducing the negative impact of invasive crayfish *Faxonius limosus* in the Danube by smart exploitation of their meat and shells – DANUBEcare, as well as Ministry of Science, Technological Development and Innovation of the Republic of Serbia (Registration number: 451-03-137/2025-03/ 200134 and Registration number: 451-03-136/2025-03/ 200134)