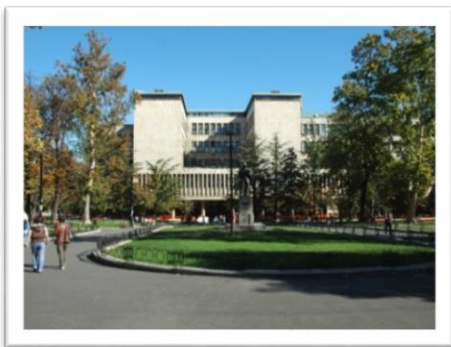




FoodEnTwin Symposium: Novel analytical approaches in food and environmental sciences Book of Abstracts



June 16-18, 2021
Belgrade, Serbia



Scientific committee

Tanja Cirkovic Velickovic (Chair)
Dusanka Milojkovic-Opsenica (Co-Chair)
Andreja Rajkovic
Michelle Epstein
Marianne van Hage
Tatjana Parac-Vogt
Hans Groendlund
Guro Gafvelin
Andrea Urbani
Paola Roncada
Irena Vovk

Organizing Committee

Sanja Grguric-Sipka
Maja Gruden
Jelena Mutic
Dragana Stanic-Vucinic
Katarina Smiljanic
Marija Stojadinovic
Ivana Glisic



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 810752

P16

OVALEBUMIN ADSORPTION ON DIFFERENT TYPES OF MICROPLASTIC

Tamara Mutić¹, Nikola Gligorijević², Tanja Ćirković Veličković^{3,4,5,6*}

¹*University of Belgrade – Faculty of Chemistry, Belgrade, Serbia*

²*Institute for the Application of Nuclear Energy, University of Belgrade, Belgrade, Serbia*

³*Center of Excellence for Molecular Food Sciences and Department of Biochemistry, University of Belgrade–Faculty of Chemistry, Belgrade, Serbia*

⁴*Faculty of Bioscience Engineering, Ghent University, Ghent, Belgium*

⁵*Global Campus, Ghent University, Incheon, Korea*

⁶*Serbian Academy of Sciences and Arts, Belgrade, Serbia*

* Corresponding author: tcirkov@chem.bg.ac.rs

Microplastics (MPs) are small in size, have low densities, can exist in the atmosphere for a long time and can easily be spread by wind. Microplastics are plastic fibers, particles or films with diameters smaller than 5 mm and they have shown different effects on proteins. The objective of this study was to investigate adsorption affinity of different types of MPs (polyethylene terephthalate (PET), polystyrene (PS) and polyvinyl chloride (PVC)) with ovalbumin. Ovalbumin, isolated from chicken egg white, was used in this study. Plastics were mixed with ovalbumin for 1,2,4 and 19 h and then the absorbance of the remaining protein in the solution was measured at 280nm. In addition, isotherm mathematical model to calculate the adsorption affinity of ovalbumin for MPs was used. We determined affinity constants by using Langmuir isotherm models for different particle size (PS 120 μ m and PS 500 μ m), different type of plastics (PET, PS and PVC) and pH values (3 and 7,2). Adsorption experiment results showed that adsorption depends on type of plastics. Our results showed that PVC did not adsorb protein, however, PET and PS have interacted with protein. Adsorption capacities of all analysed MPs increase with pH of solution. Under different pH values, MPs and protein have different charges that may affect adsorption characteristics. With increase of pH from 3 to 7, the level of protein adsorption on MPs increased 14 times for PS (smaller in size) and 5 times for PS (bigger size) and PET.

Keywords: Microplastic, Ovalbumin, Adsorption, polystyrene, Polyethylene terephthalate

Acknowledgements: Acknowledgements: This research work was funded the Ministry of Education, Science and Technological Development of the Republic of Serbia, contract number: 451-03-9/2021-14/200168; the Serbian Academy of Sciences and Arts, grant number F-26; and the European Commission, under the Horizon2020, FoodEnTwin Project, GA No. 810752.

Београд, 30. децембар 2021.

Др Тања Ћирковић-Величковић
Хемијски факултет
Универзитет у Београду

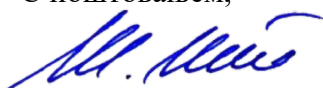
Разматран је захтев за категоризацију поглавља, који је достављен 6. септембра 2021., електронским путем Матичном одбору за хемију.

Одбор је донео одлуку да према критеријумима из важећег Правилник о стицању истраживачких и научних звања, FoodEnTwin Симпозијум „Нови Аналитички приступи у храни и науке о животној средини“, захтев је упућен од стране Тање Ћирковић Величковић

FoodEnTwin Симпозијум „Нови Аналитички приступи у храни и науке о животној средини“, одржан од 16. до 18. јуна 2021. године у Задужбини Илије М. Коларца

јесте скуп међународног карактера.

С поштовањем,



Проф. др Живослав Тешић
Председник Матичног научног одбора за хемију