

# Serbian Biochemical Society

**President:** Marija Gavrović-Jankulović

**Vice-president:** Suzana Jovanović-Šanta

**General Secretary:** Isidora Protić-Rosić

**Treasurer:** Milica Popović

## Scientific Board

Marija Gavrović-  
Jankulović

Mihajlo B. Spasić

Vesna Niketić

Ivanka Karadžić

Svetlana Dinić

Nevena Đukić

Jelena Bašić

Ivan Spasojević

Ivana Beara

Mojca Stojiljković

Andjelka Čelić

Željko Popović

Žanka Bojić

Trbojević

Milan Nikolić

Ana Ninić

Adela Pitea

Zupkó István

Vlatka Zoldos

Aleksandra Inić-

Kanada

Tomasz Jurkowski

Yaraslau Dzichenka

Brankica Janković

Sanja Krstić

## Organization

### Committee

Suzana Jovanović-  
Šanta

Jelena Purać

Milica Popović

Emilija Svirčev

Miloš Opačić

Milena Dimitrijević

Tatjana Majkić

Sofija Bekić

Diandra Pintać

Isidora Protić-Rosić

Marina Crnković

Maja Marinović

Iva Uzelac

Jovana Drljača

Miloš Avramov

Srdana Đorđievski

Milana Bosanac

Vanja Tatić

## Proceedings

**Editor:** Ivan Spasojević

**Technical support:** Jelena Korać Jačić

**Cover design:** Zoran Beloševac

**Publisher:** Faculty of Chemistry, Serbian Biochemical Society

**Printed by:** Colorgrafx, Belgrade

# Serbian Biochemical Society

## Eleventh Conference

Scientific meeting of an international character

September 22<sup>nd</sup> and 23<sup>rd</sup>, 2022, Novi Sad, Serbia

***“Amazing Biochemistry”***

---

## **R-Phycocyanin from red algae *Porphyra* spp: Binding of selected heavy metal ions**

---

**Milica Obradović, Milan Nikolić, Simeon Minić**

*Department of Biochemistry & Centre of Excellence for Molecular Food Sciences,  
University of Belgrade - Faculty of Chemistry, Belgrade, Serbia*

\**e-mail: milicaobradovic31.6@gmail.com*

Phycobiliproteins are major photosynthetic accessory pigments in cyanobacteria and red algae. Their vivid colours arise from covalently attached tetrapyrrole chromophores. The exciting characteristic of tetrapyrrole chromophores is the ability to bind metal ions. Heavy metals are among the most abundant and most dangerous environmental pollutants, and their removal from the environment is a crucial challenge. Therefore, utilizing PBPs-metal binding properties could be helpful in heavy metal detection and/or removal. The main aim of this study is to characterize the binding of selected heavy metal ions ( $\text{Hg}^{2+}$ ,  $\text{Pb}^{2+}$ ,  $\text{Cd}^{2+}$ ) to R-phycocyanin (R-PC) isolated and purified from red algae *Porphyra* spp. The protein fluorescence quenching approach revealed the strong binding affinity of R-PC to  $\text{Hg}^{2+}$  ( $K_d \sim 0.1 \mu\text{M}$ ), while protein binding to  $\text{Pb}^{2+}$  and  $\text{Cd}^{2+}$  is lower ( $K_d \sim 3 \mu\text{M}$ ) but still in the high to moderate range. Circular dichroism spectroscopy demonstrated the ability of  $\text{Hg}^{2+}$ ,  $\text{Pb}^{2+}$  and  $\text{Cd}^{2+}$  to slightly decrease the ordered secondary structures ( $\alpha$ -helical content) in R-PC. Our results indicate that R-PC could be exploited as a potential biosensor for heavy metal ions detection (especially  $\text{Hg}^{2+}$ ) in aquatic systems as well as in their removal from the environment (e.g. waste-water management).

### **Acknowledgements**

This work was supported by: ANSO, Project No. ANSO-CR-PP-2021-0,1 and the Ministry of Education, Science and Technological Development of the Republic of Serbia, No. 451-03-68/2022-14/200288.