

International Conference

**BIOBASED FUTURE: GREEN BIOPROCESSING
FOR INNOVATIVE BIOACTIVE PRODUCTS**

- Book of Abstracts -

Publisher:

UNIVERSITY OF BELGRADE, FACULTY OF TECHNOLOGY AND
METALLURGY

Karnegijeva 4, Belgrade

www.tmf.bg.ac.rs

For publisher:

Dr Mirjana Kijevčanin, dean

Faculty of Technology and Metallurgy, University of Belgrade

Editor-in-chief:

Dr Dušan Mijin, full professor

Faculty of Technology and Metallurgy, University of Belgrade

Editors:

Dejan Bezbradica, full professor FTM

Marija Čorović, senior research associate FTM

Ana Milivojević, teaching assistant FTM

Cover design:

Andrija Nikačević

Print:

R&D Center of Printing Engineering,

Faculty of Technology and Metallurgy, University of Belgrade

Circulation:

100

ISBN 978-86-7401-396-0



The project is funded by the European Union Framework Program for
Research and Innovation Horizon Europe (contract no. 101060130)

All material appearing in this Book of Abstracts is openly licensed under the
terms of the Creative Commons Attribution-NonCommercial-NoDerivatives
4.0 International license (CC BY-NC-ND 4.0)
(<https://creativecommons.org/licenses/by-nc-nd/4.0/>).

CONGRESS COMMITTEES

SCIENTIFIC COMMITTEE

Cesar Mateo, Institute of Catalysis and Petrochemistry, The Spanish National Research Council, Spain

Antonia Montilla, Institute of Food Science Research, The Spanish National Research Council, Spain

Milica Simović, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Patrick Jansen, Radboud University Medical Center, The Netherlands

Blanca de las Rivas, Institute of Science and Technology of Food and Nutrition, The Spanish National Research Council, Spain

Marija Ćorović, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Kahlile Youssef-Abboud, Centre for Healthy Eating & Food Innovation, Maastricht University, The Netherlands

Branislav Todić, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Thu-Ha Nguyen, BOKU University, Wien, Austria

Martin Rebros, Institute of Biotechnology, Slovak University of Technology, Bratislava, Slovakia

Mateja Primožič, Faculty of Chemistry and Chemical Engineering, University of Maribor, Maribor, Slovenia

ORGANIZING COMMITTEE

Nikola Nikačević, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Rada Pjanović, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Ana Milivojević, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Katarina Banjanac, Innovation Centre of the Faculty of Technology and Metallurgy, Belgrade, Serbia

Radoslava Pravilović, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Milica Veljković, Innovation Centre of the Faculty of Technology and Metallurgy, Belgrade, Serbia

Anja Petrov Ivanković, Innovation Centre of the Faculty of Technology and Metallurgy, Belgrade, Serbia

Ana Vukoičić, Innovation Centre of the Faculty of Technology and Metallurgy, Belgrade, Serbia

Aleksandra Tomić, Faculty of Technology and Metallurgy, University of Belgrade, Serbia

Fourier transform infrared spectroscopy as a tool for chemical analysis of nanoliposomes with aloe extract

Bojana Balanč^{1*}, Milena Milošević², Predrag Petrović¹, Radoslava Pravilović¹, Verica Đorđević³, Branko Bugarski³, Aleksandra Jovanović⁴

¹ Innovation Centre of the Faculty of Technology and Metallurgy, Belgrade, Serbia

² University of Belgrade, Institute of Chemistry, Technology and Metallurgy, National Institute of the Republic of Serbia, Belgrade, Serbia

³ University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia,

⁴ University of Belgrade, Institute for the Application of Nuclear Energy INEP, Belgrade, Serbia

Introduction: Aloe or *Aloe vera* (L.) Burm. f. (Asphodelaceae family) has been known and used for centuries for its health, beauty, medicinal, and skin care potential. The plant contains 75 potentially active constituents: enzymes, sugars, lignin, saponins, anthraquinones, salicylic acid, amino acids, vitamins, and minerals. *A. vera* possesses healing, anti-inflammatory, antiseptic, laxative, antiviral, immunostimulant, moisturizing, anti-aging, and antitumor properties. With the aim to protect its bioactives from degradation and contribute to control release technology, as well as the development of better-quality formulations, aloe extract can be encapsulated in liposomes. Encapsulation is defined as a process that entraps substances, particularly thermosensitive or bioactive compounds in liquid extract, into a shell of wall material or matrix to produce particles with different sizes, ranging from nanometres to millimeter scale.

Experimental: Extraction from aloe leaves was done on the shaker at 80°C, using a solid-to-solvent ratio of 1:30 g/mL and 70% v/v ethanol for 30 min. The liposomes with encapsulated extract were developed in the proliposome procedure. A mixture of lipids (1 g) and *A. vera* extract (4 mL) was stirred at 50°C. After cooling to 25°C, 20 mL of the aqueous phase was transferred and stirred for 2 h. To investigate the influence of UV irradiation on the extract-loaded liposome, a liposomal population (5 mL) was UV-irradiated by UV-C irradiation at a wavelength of 253.7 nm in a quartz tube at 25°C for 30 min. Then, the non-treated and UV-irradiated liposomes were freeze-dried at -75°C (in a vacuum) for 24 h. Fourier transform infrared (FT-IR) spectra were recorded in a range of 400 to 4000 cm⁻¹.

* Corresponding author: bisailovic@tmf.bg.ac.rs

Application of Lion's Mane Mushroom in Cosmetics: The Influence of Drying Method and Solvent

Anja Malović¹, Joka Nikolić¹, Aleksandra Jovanović², Rada Pjanović¹, Katarina Banjanac³, Milica Veljković³, Verica Đorđević¹, Predrag Petrović^{3*}

¹ University of Belgrade, Faculty of Technology and Metallurgy, Belgrade, Serbia

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

³ Innovation Centre of the Faculty of Technology and Metallurgy, Belgrade, Serbia

Introduction: Mushrooms have traditionally been studied for their nutritional and medicinal properties; however, growing interest has recently emerged in their potential applications in cosmetics. Increasing evidence suggests that mushrooms are a rich source of valuable cosmeceuticals, particularly compounds with anti-aging properties, which are among the most sought-after in skincare. As the market for mushroom-based cosmetics continues to expand, there is a clear need for further scientific research in this area. Lion's mane mushroom (*Hericium erinaceus*) is a fungi species that parasitizes on oaks and produces characteristic irpicoid fruiting bodies; in recent years, it has gained popularity as a commercially cultivated edible species with potential health benefits. The aim of this study was to investigate the potential cosmetic benefits of lion's mane mushroom.

Experimental: The effect of drying was assessed using two methods: heat drying (38°C, 24 h) and freeze-drying (-40°C, 0.12 mbar, 24 h). Additionally, the influence of solvent polarity was evaluated using water and water-ethanol mixtures containing 30%, 50%, and 70% ethanol. The resulting extracts were subjected to chemical and biological characterization, with a focus on compounds and activities beneficial for skincare. Total carbohydrates were quantified via the phenol-sulfuric acid method. Sugars and polyols were analyzed using HPLC, and glucan content was determined with a Megazyme[®] β -Glucan Assay Kit. Antioxidant activity was assessed *in vitro* using ABTS, CuPRAC, and β -carotene bleaching assays. Antityrosinase activity was evaluated via an *in vitro* enzymatic assay.

* Corresponding author: ppetrovic@tmf.bg.ac.rs