

**Ivane Javakhishvili Tbilisi State University**

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**Abstract**

**ACTIVE AGAR MINERALIZED COMPOSITE FILMS INTENDED FOR FOOD PACKAGING**

***Neda Radovanović<sup>a</sup>, Miona Miljković<sup>b</sup>, Slađana Davidović<sup>b</sup>, Ivana Malagurski<sup>b</sup>, Milan Gordić<sup>c</sup>, Aleksandra Nešić<sup>c,d</sup>, Suzana Dimitrijević-Branković<sup>b</sup>***

<sup>a</sup> University of Belgrade, Innovation Center of the Faculty of Technology and Metallurgy, Karnegijeva 4, Belgrade, Serbia, E-mail: [nradovanovic@tmf.bg.ac.rs](mailto:nradovanovic@tmf.bg.ac.rs)

<sup>b</sup> University of Belgrade, Faculty of Technology and Metallurgy, Karnegijeva 4, Belgrade, Serbia

<sup>c</sup> University of Belgrade, Vinča Institute of Nuclear Sciences, Mike Petrovića Alasa 12-14, Belgrade, Serbia

<sup>d</sup> Universidad de Concepción, Technological Development Unit, Cordillera Ave. 2634, Parque Industrial Coronel, Coronel, Correo 3, Concepción, Chile

Polysaccharide-based materials represent an attractive alternative to plastics, due to their biodegradability, compatibility and great film forming properties<sup>1</sup>. As they are usually characterized by poor mechanical and barrier properties and lack of functionality, different components must be incorporated into these biopolymer materials in order to improve their properties. In this study, new mineralized, agar-based composite films with increasing Cu-phosphate mineral phase loadings (1, 2.5 and 5 mM) were prepared by *in situ* mineralization and solvent casting method. The presence of mineral significantly influenced the morphology, properties and functionality of the obtained composite films. Reinforcement with the Cu-phosphate phase improved in a concentration-dependent manner, optical, mechanical and water vapor barrier properties of the obtained mineralized films. In addition Cu-phosphate mineralized agar films exhibited antimicrobial activity against both, Gram positive and Gram negative bacteria, *Staphylococcus aureus* and *Escherichia coli*, respectively. The results of this study suggest that agar films mineralized with Cu-phosphate could be potentially used as affordable, eco-friendly and functional food packaging materials with tunable properties. Production procedure offers possibilities for increasing Cu-mineral phase content without compromising properties of the composite films.

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**References**

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