

FEMS 2023

Abstract Book



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W209 - Microbial live interactions with textiles

Presenting Author - *Vukašin Janković, Institute Of Molecular Genetics And Genetic Engineering, University Of Belgrade, Serbia*

Author/s – *Jasmina Nikodinovic-Runic, Tatjana Ilic-Tomic, Milena Stevanovic, Marija Nenadovic*

Abstract Content

Microorganisms, especially soil-dwelling *Streptomyces*, have the potential to both degrade and colour a variety of textiles. Pigments from Streptomycetes could serve as colouring agents for different natural and synthetic fabrics. Apart from pigments, *Streptomyces* can produce a variety of enzymes. Several of these enzymes show favourable application in the depolymerization of synthetic materials such as polyamide and polyurethane.

The aim of this study was the assessment of live interactions of pigmented *Streptomyces* strains from the lab collection using polyamide (PA) and Polyamide/Elastane (PA/EA) knits as substrates.

Cultivation of pigment-producing *Streptomyces* strains was done following the standard microbiological protocols, using two different growth media with the addition of PA and PA/EA knits into flasks. Cultures were incubated at 30°C for 7 and 14 days under static and dynamic conditions. Materials were recovered and their colour coordinates, colour difference (ΔE), and fastness were determined, and their surface changes were examined by Scanning Electron Microscopy (SEM).

The incubation of knits with living bacterial cultures resulted in both live dyeing and degradation, depending on the strain used. The intensity of color yield was larger under dynamic culture conditions. Therefore, *Streptomyces* strains could be successfully applied in the development of greener dyeing and degradation bioprocesses.