

# 23<sup>rd</sup> Congress of Chemists and Technologists of Macedonia

## BOOK of ABSTRACTS



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## BIODEGRADATION RATE OF COMMERCIAL DETERGENT BY *MUCOR RACEMOSUS*

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The present study was focused on determination of biodegradation rate of commercial detergent ("Merix", Henkel, Serbia) by fungus *Mucor racemosus* Rifai as well as on the influence of tested detergent on fungal growth. The fungus was enriched from wastewater samples of the Rasina River, downstream where the industrial wastewaters of factory Henkel (Krusevac, Serbia), discharge into river. Fungus was cultivated in liquid Czapek Dox's growth medium with addition of detergent at a concentration of 0.3% (D3 medium) and 0.5% (D5 medium). The fungal growth and total dry weight biomass in these media was determined on 3<sup>rd</sup>, 6<sup>th</sup>, 9<sup>th</sup>, 12<sup>th</sup> and 16<sup>th</sup> day. At the same time, biodegradation rate of anionic detergent was determined by MBAS assay. The presence of detergent in growth media was influenced on biphasic exponential growth of fungus. In medium with 0.3% detergent, primary exponential growth phase was noted from inoculation until 3<sup>rd</sup> day and secondary phase from 9<sup>th</sup> to 12<sup>th</sup> day. However, in medium with 0.5 % detergent, primary exponential growth phase was observed from 3<sup>rd</sup> to 6<sup>th</sup> day and secondary phase from 9<sup>th</sup> to 16<sup>th</sup> day. The differences in biodegradation rate between these media were the most manifested during primary exponential growth phase. During first 3 days, the fungus decomposed 26% and 18% of initial detergent concentration in D3 and D5 media, respectively. From 3<sup>rd</sup> to 6<sup>th</sup> day, the fungus decomposed 25% of detergent in D3 medium and 56.16% of detergent in D5 medium. At the end of experimental period (16<sup>th</sup> day), the fungus decomposed total 49.5% of detergent in D3 medium, and 62.2% of detergent in D5 medium, respectively. From the equation of regression curve, it was calculated that the fungus could be able to degrade 80% of the initial detergent concentration of 0.3% for 24.3 days, *i.e.* 80% initial detergent concentration of 0.5% for 18.3 days. According to results presented, the fungus acts as potential candidate for bioremediation of anionic surfactants contaminated environments.

**Keywords:** biodegradation rate, commercial detergent, *Mucor racemosus*



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