



XIV INTERNATIONAL CONFERENCE ON SOCIAL AND TECHNOLOGICAL DEVELOPMENT – STED 2025

THE BOOK OF ABSTRACTS

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NOTE:

The authors have full responsibility for the originality and content of their own papers.

BETA-DIKETO ESTERS IN REMEDIATION PROCESS OF SEWAGE SLUDGE

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ABSTRACT

The Claisen condensation reaction between diethyl oxalate and methyl ketone (2-Acetyl Thiophene) was performed to obtain sodium salts of biologically important beta-diketo ester. The antimicrobial activity was tested *in vitro* to further investigate the antimicrobial potential of the compound for future use in sludge treatment. Microbiological research was conducted in two directions. The first direction is the examination of whether and in what concentrations the substance has an antimicrobial effect, that is, the assessment of whether the substance will disturb the natural microflora in water or soil. The antimicrobial action of the substance was tested using the microdilution method, using a certain number of microorganisms isolated from nature (isolates from heavy metal pollution sites) and standard strains (ATCC).

After that, the treated sludge was used and mixed with fertile soil in different ratios to determine the most suitable ratio for mixing the treated sludge with the soil. As a control, we used soil that contained untreated sludge. Crops of plants were planted on such soil. The tested substance had a certain degree of influence on microorganisms, but the degree of influence was significantly lower than the positive control (antibiotic). The results show that in the waste sludge there are almost no bacteria, or the number is extremely low. After a certain vegetation period, it is observed that the total number of bacteria and coliforms is the lowest on the substrate (fertilizer), control, and that it is the highest on KKM50 (half of the substrate and half of sewage sludge tested with the substance). The results

also showed that the compound has a favorable effect on the maintenance of the microbiological community in the soil compared to the control.

Keywords: beta-diketo esters, antimicrobial effects, remediation process, sludge treatment, environmental protection.

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