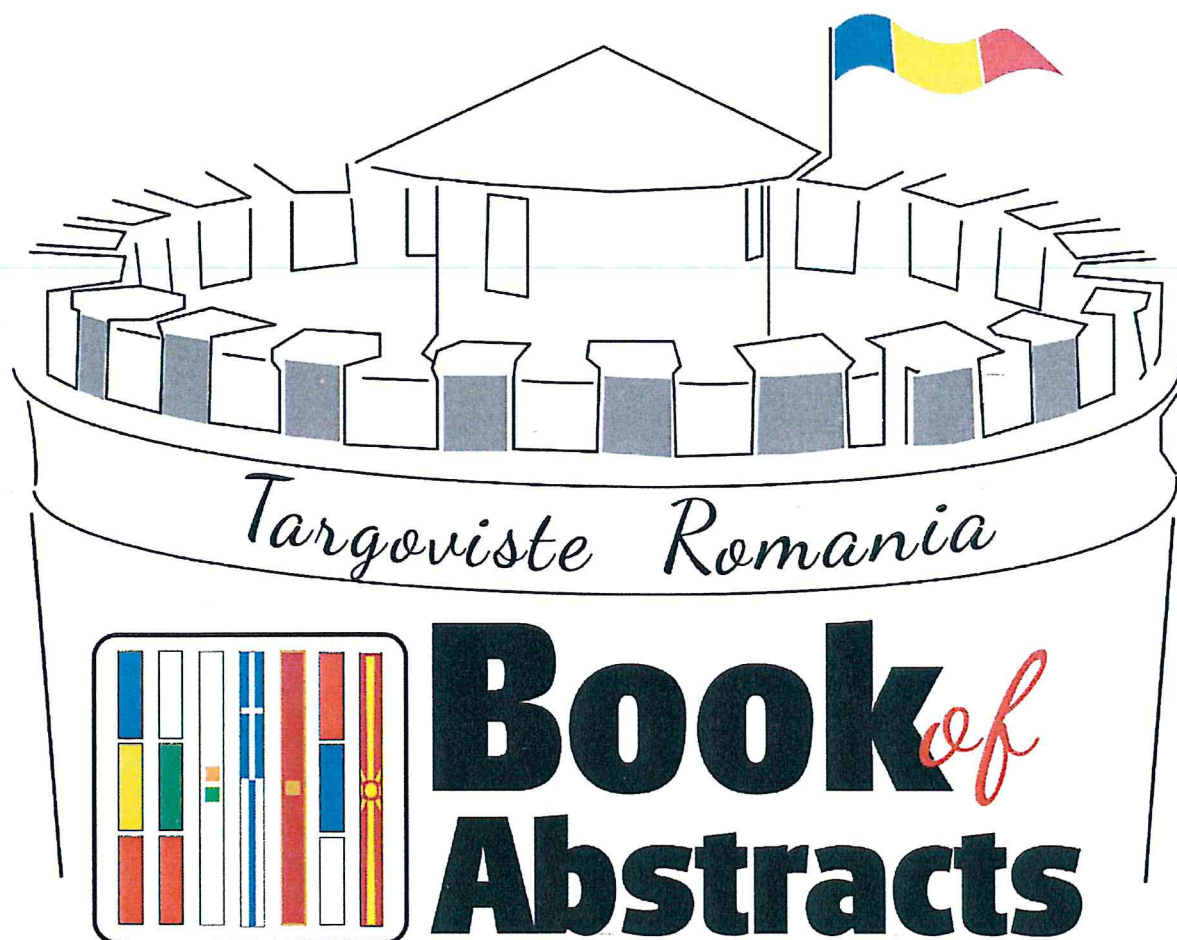
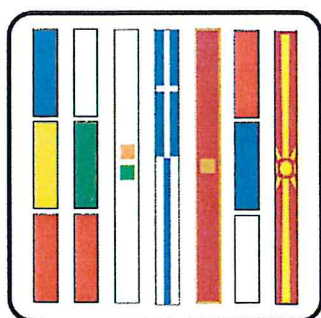


9th International Conference of the Chemical Societies of the South-Eastern European Countries



Targoviste Romania



Book *of* Abstracts

08th-11th May 2019 Chemistry a Nature Challenger



Valahia University
of Targoviste



Romanian
Chemical Society



University POLITEHNICA
of Bucharest

MODULATION OF THE BIOCIDES EFFECTS BY DIFFERENT CHEMICAL STRUCTURES

LUCIAN IONESCU¹, ALINA ROXANA BANCIU¹, DANIEL MITRU¹,
MIHAI NITA-LAZAR¹

Abstract. Antiseptics and disinfectants have been used in healthcare settings as an essential part of prevention and infection control practices, especially related to nosocomial infections. Biocides have a broader spectrum of activity than antibiotics and, while antibiotics tend to have a specific intracellular target, these may have multiple targets [1]. Different types of biocide were investigated to comprehend how their chemical structures and concentrations affect aquatic organisms. In our study, we analyze the toxic impact of different biocide chemical structures on bioluminescent marine bacteria (*Aliivibrio fischeri*). The *A. fischeri* Gram-negative bacteria light emission inhibition test has been reported as the most sensitive test in comparison to other bacterial based bioassays and it is described as being rapid, easy to perform and cost-efficient [2] in evaluation the toxic effect of a specific chemical compound. The bioassay consisted in monitoring the luminescence emitted by *A. fischeri* with analyzer Microtox[®] M500, as an indicator of bacterial respiration and metabolism which could be inhibited by various toxic chemical compounds at specific concentrations.

The results, obtained after incubating *A. fischeri* in presence of two biocide compounds based on chlorine and oxygen, showed a difference in the bacterial response to the chlorine vs. oxygen. Moreover, the bacterial metabolism monitor by the luminescence readings was proportionally inhibited with the concentration increase of the two biocide compounds. Overall, it was observed a difference in the bacterial response induced by a

¹ National Research and Development Institute for Industrial Ecology ECOIND, 060652, Bucharest, Romania.
E-mail: lucian.ionescu@gmail.com.

specific chemical structural type and this direct link between bacterial response was modulated the compound concentration, too.

Keywords: biocides; chemical structures; *Aliivibrio fischeri*; luminescence.

References

[1] G. McDonnell, A.D., Russell, *Antiseptics and Disinfectants: Activity, Action, and Resistance*, *Clinical Microbiology Reviews*, 12(1):147-179, 1999.

[2] P. Westlund et al., *Investigation of Acute and Chronic Toxicity Trends of Pesticides Using High-Throughput Bioluminescence Assay Based on the Test Organism *Vibrio fischeri**, *Arch Environ Contam Toxicol.*, 74(4):557-567, 2018.