EFFECT OF SELECTION UPON RESISTANCE OF MICROORGANISMS TO WHITE PHOSPHORUS

A. Z. Mindubaev*, A. D. Voloshina, N. V. Kulik, Sh. Z. Validov[1], K. A. Saparmyradov[1], S. T. Minzanova, L. G. Mironova, and D. G. Yakhvarov

State Budgetary-Funded Institution of Science Arbuzov Institute of Organic and Physical Chemistry of Kazan Scientific Center, Russian Academy of Sciences, Kazan',
*e-mail: mindubaev@iopc.ru
[1]Kazan (Volga region) Federal university, Kazan'

Received December 26, 2017

Abstract – Aiming at detoxification of dangerous technogenic pollutant – white phosphorus – an effect of controlled selection of a series of microorganisms (*Aspergillus niger* AM1, *Streptomyces* sp. A8, *Trichoderma asperellum* F-1087) on their resistance to white phosphorus was studied in synthetic culture media containing P_4 as the sole phosphorus source at concentration level of up to 1%. The selection resulted in increasing resistance of the studied organisms. The best adaptability to white phosphorus was demonstrated by streptomycete strain *Streptomyces* sp. A8, which was further investigated using biochemical analysis and metabolic profiling. A procedure for sterilizing P_4 with acetone treatment under mild conditions was developed. Practical recommendations for neutralizing soil contaminated with white phosphorus were proposed, as exemplified by soil treatment with a powdered formulation of the fungus *T. asperellum* F-1087.

Keywords: detoxication, white phosphorus, culture media, *Aspergillus niger* AM1, *Streptomyces* sp. A8, *Trichoderma asperellum* F-1087.