IMPROVEMENT OF THE MICROBIOLOGICAL QUALITY OF EXTREME HYPERSALINE LAKES IN OCNA SIBIULUI ROMANIA USING MATHEMATICAL MODELS

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Abstract: The microbiological quality in three extreme hypersaline lakes in Ocna Sibiului, Romania, can be appreciated using the indicator BISQ (Biological Indicator of Slimes Quality). For the analysis of three important chemical and physical variables (pH, magnesium and chloride ions) on this indicator, a polynomial mathematical model was build. The model allows the theoretical study of the influence of the three chosen variables on BISQ at the end of spring and at the end of autumn, the two important moments when slimes are harvested for medical treatments. Using the model, response surfaces were also built; the response surfaces offer the solutions for the improvement of slimes microbiological quality in each lake by changing pH and chloride content at the maintaining of Mg^{2+}constant, corresponding to the real magnesium concentration. In the Brâncoveanu and Red Lake, the best solution is to create a pH near 7; in the Black Lake, the optimal condition to increase the quality of slime in spring is to decrease pH to 5, whereas the slimes harvested at the end of autumn are improved when pH increases to 7.

Keywords: microbiological quality, extreme hypersaline lakes

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