DETECTION OF SULFATE-REDUCING BACTERIA FROM VARIOUS ECOTOPES BY REAL-TIME PCR

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The study of detection effectiveness of sulfate-reducing bacteria (SRB) in the samples from various ecotopes by microbiological (cultural by serial dilutions) and molecular biological (by real-time PCR) methods with designed test-systems lyophilized on the silicon microchip was
performed. The developed DSRM and SRB2 test-systems for detection of the functional gene \( dsrA \) presence, encoding one of the key enzyme of dissimilatory sulphate-reduction pathway — dissimilatory sulfite reductase were used. It was found that the minimal determined SRB titres in water samples were \( 10^4 \) cells/ml and in soil samples they were \( 10^2 \) – \( 10^5 \) cells/g of absolutely dry soil. In natural and man-caused samples, the amount of SRB detected by the microbiological method was correlated with calculated values determined by the molecular biological method, Pearson’s indexes were 
\[
\begin{align*}
r &= 0.41–0.69 \\
k &= 11, \\
P &\leq 0.01–0.05
\end{align*}
\]
Thus, real-time PCR assay with designed test systems lyophilized on the silicon microchips is a high-quality and rapid method for the detection of SRB in various natural and man-caused ecotopes.

Key words: \textit{dsrA} gene, test-systems, sulfate-reducing bacteria, biocorrosion, real-time PCR.

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