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THE EFFECT OF SELECTED ENVIRONMENTAL CHANGES TO THE FATTY ACID COMPOSITION OF BIOLUMINESCENT BACTERIA *ALIIVIBRIO FISCHERI*

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Aliivibrio fischeri (*formerly Vibrio fischeri*), the ISO standard test organism, has been used for toxicity testing (mainly in ecotoxicology) already 30 years. The luminescence inhibition assay is commercialised as Microtox^{TM} (performed at 15^{o}C) since 1979. This assay is very rapid, sensitive and cost-effective: the toxic effect of chemicals on bacterial bioluminescence is noticeable already in the first 30 seconds of exposure. We have shown that this assay can be transformed into high throughput format and even used for synthetic nanoparticles. However, plate luminometers enabling high throughput toxicity testing usually cannot be operated at 15^{o}C. Thus, the effect of *A. fischeri* test temperature (20^{o}C vs 15^{o}C) on toxicity results was compared. We showed that at given exposure time toxicity was dependent on the testing temperature as well as on type of chemicals. For example, at 15^{o}C aniline was twice more toxic than at 20^{o}C. One of the adaptation mechanisms of *Pseudomonas* and *Vibrio* to environmental changes (temperature, osmolarity, salinity, pH, presence of toxicants) is the ability to adjust their membrane lipid composition, e.g. changes in the degree of saturation and *cis-trans* isomerisation. The aim of this study was to investigate the effect of temperature and different toxicants on the cellular fatty acid composition of *A. fischeri*. Freshly prepared *A. fischeri* suspension was exposed to three organic substances (aniline, 2,3,4-trichloroaniline and 3,5-dichlorophenol) with different Log K_{ow} and one inorganic substance ($CuSO_4$) for 30 minutes at their respective EC50 level at two different temperatures (15 and 20 ^{o}C). The fatty acids from 60 freeze-dried samples were methylated (HCl/MeOH), extracted and the cellular fatty acid composition (chain length from C10:0 to C20:0) was determined by gas chromatography (GC). Preliminary results indicate that fatty acid *cis-trans* ratio at 20^{o}C was decreased when compared to 15^{o}C regardless of the toxicant. Decrease of *cis-trans* ratio is known to increase membrane rigidity (as *trans* fatty acids pack together more tightly than *cis* ones) and in our case most likely works as a counterbalance to temperature-related increases in fluidity.

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