

The Potential Application of Cyanobacteria (*ANABAENA CYLINDRICA*) as Whole – Cell Biosensor to Detect Pesticides

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ABSTRACT

Environment is often polluted with more than one type of toxicants such as pesticides and *Anabaena cylindrica* had the potential to be applied in a whole-cell biosensor to detect pesticides. *A. cylindrica* had been immobilized in 1% agarose gel and exposed to five different concentrations of three pesticides which were 2,4-dichlorophenoxyacetic acid (2,4-D), methyl parathion and atrazine. The response were determined by measuring the absorbance reading at 450 nm, which was the optimum absorption wavelength of β -carotene. Based on single toxicity test, there was an increase in the percentage of absorbance change for all three pesticides due to the increased production of β -carotene to overcome the oxidative damage caused by pesticides. As for combined toxicity test, there was an in the percentage of absorbance for all combination of pesticides. All combination of pesticides at 0.01 mg/L showed a synergistic effect when compared to single toxicity testing and this was due to pesticides were unable to interact with one another at low concentration to form less toxic complex. At concentration higher than 0.01 mg/L, antagonistic effect was observed for all combination of pesticides as the high concentration enable them to interact with one another to form less toxic complex. However for methyl parathion and atrazine in combination, which produced a synergistic response at 0.10 mg/L as well.