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THE CHANGES OF pH, CONDUCTIVITY, AND DISSOLVED OXYGEN IN CYANOBACTERIA *Arthrospira platensis* CULTURE WITH THE PRESENCE OF ENVIRONMENTAL POLLUTANTS

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THIS DISSERTATION IS SUBMITTED IN FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF BACHELOR OF BIOTECHNOLOGY (HONOURS)

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ABSTRACT

Large amount of pollutants such as heavy metal, light metal, and pesticides are released into environment which led to environmental pollution Thus a simple, rapid and low cost bioindicator are required to screen these pollutants in aquatic environment. Whole cell bioindicators can be an effective and fast detection method as they are highly sensitive and inexpensive to screen the pollutants. The main objective of this project was to determine the changes of parameters such as pH, conductivity, dissolved oxygen in *A. platensis* with presence of Pb, Cd, Al, Li, parathion and atrazine. Five mL of *A. platensis* cells from day 4 culture were exposed to different concentration of pollutants (0.010 mg/L, 0.100 mg/L, and 1.000 mg/L). Then, the pH level, conductivity level, and dissolved oxygen level were determined by pH meter, conductivity electrode, and oxygen electrode respectively in every 0^{th} hour, 1^{th} hour, 2^{nd} hour, 6^{th} hour and 24^{th} hour. The results showed the pH level, conductivity level increased, and decreased in dissolved oxygen level as increased in concentration of pollutants. This was because *A. platensis* unable to undergo photosynthesis due to depletion of O_2 and nutrients, therefore the *A. platensis* couldn't survived in the presence of pollutants. This experiment was carried out successfully and the potential of *A. platensis* as a whole cell biondicator to detect the environmental pollutants was determined.

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LIST OF ABBREVIATIONS

ROS	Reactive oxygen species
PQ	platoquinone
D_1	PsbA
Pb	Lead
Cd	Cadmium
Al	Aluminium
Li	Lithium
Mg	Magnesium
O_2	Oxygen
H_2O	Water
H^+	Hydrogen ion
NH_4^+	Ammonium ion
CO_3^{2-}	Carbonate ion
P^{3-}	Phosphorus ion
NADPH	Nicotinamide adenine dinucleotide phosphate
ATP	Adenosine triphosphate
$PbNO_3$	Lead (II) nitrate
$Cd(NO_3).4H_2O$	Cadmium nitrate tetrahydrate
$Al(NO_3)$	Aluminium nitrate
$LiNO_3$	Lithium nitrate
mg/L	milligram per liter