

# RESPONSE OF NATURALLY OCCURRING CAROTENOIDS TO COPPER IN BIOSENSOR APPLICATION

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## ABSTRACT

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Water pollution is a worldwide phenomenon. A reliable screening method is pressingly needed for rapid detection of water pollutants, especially for the sample which the source of pollution is unknown. The objective of this study is to identify the potential of carotenoid-based biosensor as heavy metal indicator. *Daucus carota* cells were used with spectrophotometer as the transducer. The growth pattern of the *D. carota* was characterized by observing the growth curve which was obtained from the cell count. The conditions for the immobilization of cells – concentration of agarose and temperature of immobilization - were determined to be 0.5% agarose at 45°C. The immobilized cells at different growth phases were tested using different concentrations of copper (Cu). The response produced by the carotenoids-containing cells was measured spectrophotometrically with the wavelength set at 450 nm after exposure to the heavy metal, and it was found that the cells at the stationary phase produced the best response. The *D. carota* cells serve as a potential candidate for biosensor application due to the rich carotenoids content, and has proven to be effective for the qualitative measure, but not for quantitative measure of the pollutant.