THE EFFECT OF pH ON *Daucus carota* BLOSENSOR FOR HEAVY METAL DETECTION

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ABSTRACT

Water pollution caused by heavy metal such as Copper (Cu) is commonly found in water sources. The main sources causing Cu water pollution is the used of copper household plumbing system which Cu leach into water supplies through corrosion and chemical fertilizer used in agriculture running into river. Heavy metal is demanding for detection by using various conventional methods. However conventional techniques are suffered from disadvantages such as expensive equipment and demand skilled technicians. Biosensor poses advantages which are low cost, sensitive and easy to operate over the conventional methods for the detection of heavy metal. A whole cell biosensor has been developed for the detection of heavy metal, Cu by using *Daucus carota* as the biological component. The *D. carota* were immobilized at optimal condition (Day 14 of culture, 0.5 % and 45 $^{\circ}$C of agarose). The response of carotenoids in *D. carota* to the concentration 1, 5 and 10 ppm of Cu with varying pH (6.0, 6.5, 7.0, 7.5 and 8.0) were determined at optimal response time at 75 min (after exposed to Cu) by UV-Vis spectrophotometer at 450 nm. The change in absorbance reading indicated the change in concentration of carotenoids in cells which response to heavy metal. The optimal pH condition (pH 7.5) response by carotenoids in cells were subsequently tested the wider range of Cu concentration with 0.01, 0.10, 1.00 and 10.00 ppm. The finding showed that the biosensor given good response to Cu range from 0.01 to 10.00 ppm.