EXTRACELLULAR BIOSYNTHESIS OF IRON-BASED NANOPARTICLES BY ISOLATED BACTERIA FROM SOIL

DURRA SHAHIRAH BINTI MOHD AZMAN

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Durra Shahirah Binti Mohd Azman

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ABSTRACT

EXTRACELLULAR BIOSYNTHESIS OF IRON-BASED NANOPARTICLES BY ISOLATED BACTERIA FROM SOIL

Nowadays, nanotechnology has exposed the great advancement of technology to humans, lifting the world to more advanced levels. Iron nanoparticles synthesis has been gaining attention due to its high demand from industry. Biological synthesis seems to be one of the best approachable ways because it is safe to environment. The main objectives of this study are to isolate potential bacteria that can produce iron-nanoparticles from soil and to screen potential bacteria using UV-Vis Spectrophotometer. A total of 17 bacteria were isolated from three different soil samples. Based on colony morphology, the isolates number had been reduced to only 5 distinctive bacteria. Bacteria A was found in crenated edge, rough surface, irregular, opaque and pale white in colour. The description for bacteria B was circular in shape, smooth, undulating, translucent and yellow in colour. Bacteria C, it was appeared smooth, circular, translucent, undulating, orange in colour. Bacteria D appeared to be undulating, irregular, dull, opaque, and white in colour. It also was claimed to be a motile organism based on spread growth. Meanwhile, bacteria E appeared to be circular, smooth surface, opaque, and light yellow in colour. Spectrophotometer analysis had shown that supernatant bacteria A contained 0.093 mg/mL of Fe_2O_3, bacteria B, 0.149 mg/mL; bacteria C, 0.124 mg/mL; bacteria D, 0.103 mg/mL and in supernatant bacteria E, amount of Fe_2O_3 present was 0.098 mg/mL. Since supernatant bacteria A contained the lowest amount of Fe_2O_3, it indirectly became the most highly potential bacteria in synthesizing Fe_3O_4.