IDENTIFICATION OF IRON NANOPARTICLES-SYNTHESIZING BACTERIA

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ABSTRACT

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Iron nanoparticles synthesized by microorganisms especially bacteria provide many advantages to the human and environment due to their unique and special properties of cost-effective, non-toxicity, and eco-friendly. Thus, bacterial identification is the crucial step of exploring these iron nanoparticles-synthesizing bacteria for further uses and applications. The main objectives of this study are to screen bacteria that can synthesize iron nanoparticles, to identify the bacteria through colony and cellular morphological observations and biochemical tests. The strain was identified by first screening of the bacterial sample through the formation of iron nanoparticles using UV-Vis spectroscopy, followed by morphological observations and biochemical tests. During screening, supernatant bacteria sample labeled as 209, 49, MW1 and WW2 had 0.12 mg/mL, 0.17 mg/mL, 0.15 mg/mL and 0.19 mg/mL of Fe_2O_3, respectively. Supernatant bacteria labeled 209 contained the lowest amount of Fe_2O_3 and this indicated that more Fe_2O_3 was reduced to Fe_3O_4. Bacterium labeled 209 was proceed with identification tests. This strain was aerobic, thermophiles, motile, Gram variable and rod-shaped bacterium with the size of 0.128 μm × 0.654 μm. The colonies have irregular form and white pigmentation as well as wrinkled surface. This bacterial strain was an endospore-former and containing extracellular protective capsule. This bacterium shows positive catalase and citrate tests, meanwhile negative for urease and Methyl-Red tests. The strain was identified as *Bacillus sp.*