CHARACTERIZATION AND ANTIBACTERIAL ACTIVITY OF SILVER NANOPARTICLES SYNTHESIZED WITH THE MANGOSTEEN (*Garcinia mangostana*) PEEL EXTRACT

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This Final year project report entitle **"Characterization and Antibacterial Activity of Silver Nanoparticles Synthesized with The Mangosteen (*Garcinia mangostana*) Peel Extract"** was submitted by Nurul Izzati Binti Azahari, in partial fulfilment of the requirements for the Degree of Bachelor of Sciences (Hons.) Biology, in the Faculty of Applied Science and was approved by

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ABSTRACT

CHARACTERIZATION AND ANTIBACTERIAL ACTIVITY OF SILVER NANOPARTICLES SYNTHESIZED WITH THE MANGOSTEEN (*Garcinia mangostana*) PEEL EXTRACT

The biosynthesis of silver nanoparticles (AgNPs) has attracted a lot of attention in the field of nanotechnology due to its antibacterial and biomedical uses. The green synthesis of AgNPs is anticipated to be a more affordable and ecologically friendly alternative in the current research context. In the present study, AgNPs were synthesized using fruit peel extracts from the mangosteen, *Garcinia mangostana* (as the reducing agent), and the synthesized AgNPs were characterized, as well as their antibacterial properties were assessed. The characterization of synthesized AgNPs were performed by UV-visible spectroscopy (UV-Vis), Scanning electron microscopy (SEM) and Fourier-transform infrared microscopy (FTIR). The UV-Vis spectra showed a distinctive peak of AgNPs at 472.9 nm, demonstrating successful production of the AgNPs using the mangosteen peel extract. SEM images showed that most of the particles produced by the formation of stable AgNPs have a spherical shape with a nanoscale size. FTIR spectrum confirmed the existence of OH and C=O groups in *G. mangostana*-AgNPs, which might responsible for capping and surface reduction of silver ions nanoparticles. This mangosteen peel extract mediating green biosynthesized AgNPs exhibit good in antibacterial activity where exhibit significant antibacterial activity against both Gram positive (*Bacillus licheniformis*) and Gram negative (*Escherichia coli*)). Overall, AgNPs were successfully biosynthesized using *G. mangostana* aqueous peel extract which is eco-friendly, cost effective and non-hazardous greener approach.