

UNIVERSITI TEKNOLOGI MARA

**ANTIBACTERIAL AND TOXICITY
ACTIVITIES OF GREEN
SYNTHESIZED SILVER
NANOPARTICLES FROM *Phyllanthus
amarus* EXTRACT**

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BSc

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

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ABSTRACT

Silver nanoparticles (AgNPs) were synthesized through an easy, rapid and eco-friendly pathway using various herb plant because of the huge values in medical bioengineering. Therefore, the aims of this study were to identify the formation of silver nanoparticles from *Phyllanthus amarus* extract, characterize it using UV-Visible spectrometer, identify the antibacterial and toxicity activities of bio-synthesized AgNPs. *P. amarus* was extracted and added with 1 mM of silver nitrate (AgNO₃) for 15-20 min. Then, the AgNPs synthesized from *P. amarus* extract was further characterized using UV-Visible spectrometer. The AgNPs then was tested on their antibacterial activity using disc diffusion method and toxicity activities using brine shrimp lethality assay. The result from this study, the synthesized AgNPs was noticed through the color changes from light yellow to dark brown indicated the formation of AgNPs and further confirmed by surface plasmonic resonance (SPR) band in the range of 400-450 nm using UV-Visible spectrometer. In antibacterial activity, *Pseudomonas aeruginosa* showed more sensitive result compared to the *Bacillus subtilis* towards AgNPs of *P. amarus* with highest zone inhibition of 11±0.57 mm at 1000 µg/ml and *Bacillus sp* with zone inhibition of 10±0.57 mm at 1000 µg/ml. Besides, in toxicity activity *P. amarus* extract and AgNPs was characterized as non-toxic class of LC₅₀ with 7979.98 and 2225.61 while the AgNO₃ showed toxic class with LC₅₀ of 995.68. In conclusion, *P. amarus* extract can be used efficiently as reducing and capping agent in the production of potential antibacterial and non-toxicity of AgNPs for commercial application.

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