

UNIVERSITI TEKNOLOGI MARA

**ANTIBACTERIAL AND TOXICITY
PROPERTIES OF BIOSYNTHESIZED
SILVER NANOPARTICLES BY
Lawsonia inermis EXTRACT**

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the 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

Biosynthesis of silver nanoparticles using plant extracts are currently being explored as an alternative approach in pharmaceutical and medical field. The aims of this study was synthesized and characterized silver nanoparticles (AgNPs) by using UV-Vis spectrophotometer, identified their antibacterial and toxicity activity. The biosynthesized of AgNPs were varies in the reaction time (1, 2, 3, 6 and 7) days, was characterized by UV-Vis spectrophotometer (200-600 nm). The determination of antibacterial and toxicity assays of *Lawsonia inermis* was done by Kirby–Bauer disc diffusion method (Gram-positive and Gram-negative bacterial strains) and Brine Shrimp Lethality Assay respectively. From the result, *L. inermis* leaf extract was reduced the silver ions and indicates the formation of silver nanoparticles by changing colour from dark brown to colloidal grey. The highest peak of biosynthesized silver nanoparticles from *L. inermis* extract in range from 420 nm to 471 nm. Zone inhibition for Gram-positive and Gram-negative bacterial strains at 1000 µg/ml was 12.00 mm and 12.33 mm respectively. The LC₅₀ of biosynthesized AgNPs at 1000 µg/ml was observed 7367.233 which indicate non-toxic towards the brine shrimp. To conclude, AgNPs synthesized from *L. inermis* leaves extract would be very efficient to be an alternative for antibacterial.

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