

**GREEN SYNTHESIS OF SILVER NANOPARTICLES  
USING SENDUDUK (*Melastoma malabathricum*) LEAVES  
EXTRACT: CHARACTERIZATION AND  
ANTIBACTERIAL ACTIVITY**

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## ABSTRACT

### **GREEN SYNTHESIS OF SILVER NANOPARTICLES USING SENDUDUK (*Melastoma malabathricum*) LEAVES EXTRACT: CHARACTERIZATION AND ANTIBACTERIAL ACTIVITY**

The production of nanoparticles using chemicals is extremely expensive and harmful to the environment. Thus, green synthesis of silver nanoparticles (AgNPs) is an appealing technique due to their environmentally friendly, non-toxic, and inexpensive method. In this study, green synthesis of AgNPs was attempted using senduduk (*Melastoma malabathricum*) leaves extract. Besides that, characterization of *M. malabathricum*-AgNPs was performed using UV-visible spectrophotometer (UV-Vis), Fourier-Transform Infrared spectroscopy (FTIR), Scanning Electron Microscopy (SEM) and their antibacterial activities were determined. UV-Vis absorption spectrum was observed at 421 nm and the FTIR spectra confirms the existence of various functional groups whereby the *M. malabathricum* leaves extract reacting as the reducing and stabilizing agent during the AgNPs biosynthesis process. The SEM confirmed the spherical shape of the AgNPs that are present in a nanoscale size. The antibacterial activity of the synthesized AgNPs at different concentrations (50%, 75% and 100%) showed that *M. malabathricum*-AgNPs had significant antibacterial activity at 100% concentration against *Bacillus licheniformis* (Gram positive bacteria) with inhibition zone of  $12.3 \pm 1.5$  mm and *Escherichia coli* (Gram negative bacteria) with  $15.3 \pm 3.5$  mm. Overall, the results suggested that *M. malabathricum*-AgNPs has successfully been synthesized and characterized, and the results from antibacterial study demonstrated a potent bactericidal impact which are well suited for medicinal usage and other biological applications in the future.

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