

## TITLE

### Green synthesis, characterization and anti-biofilm effect of silver nanoparticle using *Wattakaka volubilis* Linn. f.

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Nanotechnology research is emerging as cutting edge technology interdisciplinary with physics, chemistry, biology, material science and medicine. The primary concept of nanotechnology was presented by Richard Feynman in a lecture entitled “There’s plenty of room at the bottom” at the American Institute of Technology in 1959. Nanotechnology is the development of a reliable and eco-friendly process for synthesis of metallic nanoparticles. There is an increasing commercial demand for nanoparticles due to their wide applicability in various areas such as electronics, catalysis, chemistry, energy and medicine. Metallic nanoparticles are traditionally synthesized by wet chemical techniques, where the chemicals used are quite often toxic and flammable. In this research we have demonstrated that use of a natural, low cost biological biosynthesis of silver nanoparticles using *Wattakaka volubilis* Linn. f. leaf extract as reducing agent. The aqueous silver ions when exposed to leaf extract were reduced and resulted in silver nanoparticles whose average size was 50 nm. The silver nanoparticles were characterized by UV-Visible, Fourier transform infra-red spectroscopy (FT-IR), Atomic Force Microscopy (AFM) and Dynamic Light Scattering (DLS) techniques. Furthermore these biologically synthesized nanoparticles were found to be highly effective against different multi-drug resistant human pathogens. The same nanoparticles displayed high anti-oxidant potential, anti-inflammatory and anti-biofilm effect.

#### Keywords

Silver nanoparticles; *Wattakaka volubilis*; Dynamic Light Scattering; Atomic Force Microscopy; Anti-biofilm effect.