



University of Zabol
Management of graduate education
Department of biotechnology
Department of Plant Breeding and Biotechnology

Dissertation to obtain a master's degree in the field of agricultural
biotechnology

**Green synthesis of silver nanoparticles from
Calotropis procera plants and investigation of
its bacterial properties**

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Abstract:

The usual methods of nanoparticle synthesis have defects such as poor structure, low production rate, high production cost and high energy requirement. Therefore, nowadays, the tendency to use plant sources as one of the most suitable methods of nanoparticle synthesis has been noticed by researchers. In this research, the extract of the leaves of the plant was used. This plant is one of the most important medicinal plants used in Iran and Sistan and Baluchistan to treat many diseases. Therefore, the purpose of this study was the possibility of synthesizing silver and zinc nanoparticles using the extract of asterberg leaves and investigating the antibacterial properties of the produced silver nanoparticles. For this purpose, an extract was prepared from the leaves and stems of this plant and nanoparticles were synthesized. Then the produced nanoparticles were characterized (UV-Vis, XRD, TEM and FT-IR) and the sensitivity of bacterial and fungal strains to the synthesized silver nanoparticles was determined. The biosynthesis of silver nanoparticles was determined and confirmed by the aqueous extract of asterberg leaf with UV-Vis spectroscopy and transmission electron microscopy. The silver nanoparticles obtained at different reaction times had an average size of 7-10 nm and an almost spherical shape. In general, our results showed that the aqueous extract of asterberg has a good potential for the production of silver nanoparticles. Both the extract and synthesized nanoparticles have significant biological potential.

Keywords: Green synthesis, Bacterial strain, Leaf extract, Antimicrobial