



International Journal of Advanced Research in Biology, Engineering, Science and Technology
(IJARBEST)

Vol. 2, Special Issue 8, February 2016 in association with
KAMARAJ COLLEGE OF ENGINEERING AND TECHNOLOGY, VIRUDHUNAGAR
DEPARTMENT OF BIOTECHNOLOGY

ORGANIZES

DBT, NEW DELHI SPONSORED NATIONAL LEVEL CONFERENCE ON CONTEMPORARY TRENDS IN
BIOENERGY AND GREEN TECHNOLOGY: CHALLENGES AND OPPORTUNITIES [ORA-2016]

(25-26TH FEBRUARY 2016)

Green synthesis of silver nanoparticles from *Gymnemasylvestre* stem extract and its characterization studies

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ABSTRACT

In this novel approach silver nanoparticles were synthesized from *Gymnemasylvestre* stem extract. *Gymnemasylvestre* herb exhibits wide range of therapeutic properties and also the metal nanoparticles are being extensively used in many areas. Synthesis of silver nanoparticles by a safer and biosynthetic method from *Gymnemasylvestre* without using any harmful chemicals have been targeted in this study. Phytochemical studies of this plant extract revealed the presence of alkaloids, flavonoids, tannins and glycosides. Some of these phytoconstituents were responsible for the reduction of silver ions to silver nanoparticles. The bioreduced silver nanoparticles were characterized by UV-visible spectroscopy, Fourier Transform Infrared spectroscopy (FTIR) and X-Ray powder Diffraction studies. The free radical scavenging activity of stem extract of *Gymnemasylvestre* was also evaluated using DPPH assay. DPPH radical scavenging ability of *Gymnemasylvestre* stem extract was found to be 56.25%. Antimicrobial activity of these silver nanoparticles was examined through disc diffusion method. Zone of inhibition formed against silver nanoparticles at different concentrations 30, 60, 100 mg/ml was studied. Zone formation was found to be higher in gram negative microorganism at concentration of 100mg/ml. This study showed that the less used stem part of *Gymnemasylvestre* which has an extensive therapeutic value can be effectively used for green synthesis of silver nanoparticles.

Key words: *Gymnemasylvestre*, Silver Nanoparticles, Antimicrobial activity, Characterization studies

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