

## SYNTHESIS AND CHARACTERISATION OF SILVER NANOPARTICLE FROM TWO MEDICINAL PLANTS AND ITS ANTICANCER PROPERTY

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### ABSTRACT

Biosynthesis of nanoparticles by plant extracts is currently under exploitation. Medicinal plants possess immunomodulatory and antioxidant properties, leading to anticancer activities. *Jatropha curcas*, a tropical shrub plant belonging to the Euphorbiaceae family, is commercially important one as bio diesel is extracted from its seeds on industrial scale. *Jatropha gossypifolia* belongs to the same family, Eurphorbiaceae and the order, Geraniale.

The present study involves the synthesis and their characterization of silver nanoparticles from *Jatropha curcas* and *Jatropha gossypifolia*, using UV-Vis spectroscopy, Fourier transform infrared spectroscopy (FTIR) and Scanning electron microscope (SEM) and to evaluate the cytotoxic properties of these silver nanoparticles against lung cancer. The silver nanoparticles (Ag-NPs) were prepared using silver nitrate as silver precursor and the aqueous stem extracts of *Jatropha gossypifolia* and *Jatropha curcas* as reducing agent and stabilizer. The silver nanoparticles isolated from aqueous stem extract of *Jatropha curcus* and *Jatropha gossypifolia* show distinct polydispersity as it shows that synthesized nanoparticles show below 1 $\mu$ m size. For the small particles it appear at 93nm and 94nm followed to large particle synthesis at 103nm, which is due to the curcacyline A, curcain and Cyclogossine, present in the stem extract of *Jatropha curcus* and *Jatropha gossypifolia* which is mainly responsible for the reduction of silver ion. Our study showed that A549 lung cancer cell line proliferation were significantly inhibited at a dose dependent manner by AgNPs isolated from *Jatropha* species with an IC<sub>50</sub> value of 19.5  $\mu$ g/ml (*Jatropha curcus*) and 13.5  $\mu$ g/ml (*Jatropha gossypifolia*) of the concentration. The data represented in our study contribute to a novel and unexplored area of nanomaterials as alternative medicine.

**KEYWORDS:** Silver Nanoparticles, Nanomedicine, UV-Vis Spectroscopy, Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscope (SEM), *Jatropha curcus*, *Jatropha gossypifolia*, A549 Lung Cancer Cell Line