



Biosynthesis of silver nanoparticle from *Achyranthes aspera* and assessing its effect on seed germination

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Abstract : Bio-synthesis of AgNPs were rapidly synthesized at room temperature using fresh aqueous extract of leaf and stem of *Achyranthes aspera*. The use of plants in the green synthesis of nanoparticles have a cost-effective and eco-friendly approach. Surface Plasmon Resonance (SPR) confirmed the formation of AgNPs in UV-Visible spectra at 448 nm. The Fourier Transform Infrared spectroscopy (FTIR) analysis was carried out to identify and study the functional groups responsible for the bioreduction of Ag⁺. X-ray diffraction (XRD) study showed the particles to be crystalline in nature, with a face-centered cubic (fcc) structure. AgNPs was administered to observe the plant growth of *Cicer arietinum*. AgNPs

enhanced the seed quality such as germination percent, speed of germination, root and shoot length etc.

Keywords: *Achyranthes aspera*, Nano-particles, UV-VIS spectrophotometer, XRD, FTIR.

Introduction:

Nanotechnology is used to represents the design, production and application of different material at molecular, atomic and macromolecular scales in order to produce new nano-sized materials. Metal nanoparticles, particularly noble metals, have been studied mainly because of their strong optical absorption in the visible region caused by the group excitation of the free electron gas (Mohamed et al. 2000) and it is mainly related with synthesis of nanoparticles of variable size, shape, chemical compositions and controlled dispersity with their potential use for human benefits (Elumalai et al. 2010). Bio-synthesis of nanoparticles provides advancement over chemical and physical methods as it is profitable, ecofriendly, easily scaled-up and further there is no need to use toxic chemicals, high pressure and energy.

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