



Botany

Explore—Journal of Research

ISSN 2278 – 0297 (Print)

ISSN 2278 – 6414 (Online)

UGC Approved List of Journals No. - 64404

© Patna Women's College, Patna, India

<http://www.patnawomenscollege.in/journal>

Influence of nanoparticles on the seedlings of the plants belonging to the Fabaceae family

• Tanu Priya • Pallavi Kumari • Moni Kumari
• Hena Naz

Received : November 2017

Accepted : March 2018

Corresponding Author: Hena Naz

Abstract: The present investigation was undertaken to show the influence of Silver and Copper nanoparticles on seed germination under in-vitro condition and on different morphological and biochemical parameters. In this study, Silver (AgNPs) and Copper nanoparticles (CuNPs) were synthesized by a chemical reduction process. UV-vis spectrophotometer analysis revealed that synthesized AgNPs and CuNPs are in nano size range. The influence of synthesized NPs on germination and seedling growth of *M. uniflorum* and *T. foenum-graecum* was tested. Seeds of both samples were surface sterilized using ethanol 90% soaked in a sterile distilled water for 60min, then soaked in copper and silver nanoparticles at 100 mg/L (100 ppm) concentrations for

15 minutes. Plants were initiated from treated and non-treated seed embryos of both samples. The effect of nanoparticles on the morphological and biochemical level was detected. Protein, amino acid, sugar, Tannin, alkaloid and flavonoid content were used as biochemical parameters to estimate the effects of AgNPs and CuNPs on the metabolism of seedlings. The results indicated that both the nanoparticles positively influenced the growth of *Macrotyloma uniflorum* and *Trigonella foenum-graecum* plants for most of the parameters studied. In *Macrotyloma uniflorum* and *Trigonella foenum-graecum*, reduced concentration of AgNPs and CuNPs, i.e., at 100 mg/ml, had positively influenced the seed germination, root growth, biochemical metabolism of plants, such as, primary and secondary metabolites. If the concentration of both the nanoparticles increases, then it can either inhibit the growth or it can cause death of the plant.

Keywords: Silver nanoparticles, Copper nanoparticles, UV-vis spectrophotometer, biochemical parameters, metabolites.

Tanu Priya

B.Sc. III year, Botany (Hons.), Session: 2015-2018,
Patna Women's College, Patna University, Patna,
Bihar, India

Pallavi Kumari

B.Sc. III year, Botany (Hons.), Session: 2015-2018,
Patna Women's College, Patna University, Patna,
Bihar, India

Moni Kumari

B.Sc. III year, Botany (Hons.), Session: 2015-2018,
Patna Women's College, Patna University, Patna,
Bihar, India

Hena Naz

Assistant Professor, Deptt. of Botany,
Patna Women's College, Bailey Road,
Patna-800 001, Bihar, India
E-mail : henanaz64@gmail.com

Introduction:

The engineering of functional systems at the molecular scale is called nanotechnology, which is a field of interdisciplinary research. Among the different types of metallic NPs, Silver and Copper nanoparticles (AgNPs and CuNPs) have been mainly used as preliminary material due to its natural abundance, low cost production, non-toxic nature with good electrical and optical properties. For this investigation, we have synthesised silver and copper nanoparticles by the