

# **BIOSYNTHESIS OF COPPER NANOPARTICLES AND ITS EFFECT ON SEED GERMINATION OF LEGUME PLANTS**

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The global population is increasing at an alarming rate and is predictable to rise by 70% up to 2050 and thus has increased the demand for continuous food supply. Growing industrialization and population size has continuously leads to shortage of agricultural land and water. Thus in order to enhance plant growth and yield, excessive chemical fertilizers has been used by growers which ultimately lead to considerable damages on environment as well as human and animal health. Nanotechnology using nanoscience can be used as a potential source for the development of processes and products that are hardly possible to develop through conventional methods. Nanoparticles can alter the physical and chemical properties in comparison with their bulk analogues and have superior application strategies and plays a substantial role in the production of crops.

Copper nanoparticles with size ranges between 1–100 nm in diameter can be synthesised in a variety of ways such as physical, chemical and biological methods. Keeping in mind the toxic chemicals and extreme conditions required in the chemical and physical methods, biological method using Plant Growth Promoting Rhizobacter (PGPR) is preferred for the synthesis of copper nanoparticles. Biologically synthesized copper nanoparticle is more economic and eco-friendly with high stability and yield. On application of copper nanoparticle on seeds of chickpea and mung at various concentrations, it was observed that an optimal concentration is found to be suitable to improve the seed germination and growth of legume plant in a non-toxic way.

**Keywords:** Agriculture, Nanotechnology, Nanoparticles, PGPR, Legume plants