

# Magnesium Oxide Nanoparticles: Agricultural Antifungal Agent against *Fusarium moniliforme*

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**Abstract**—The application of nanotechnology has introduced new tools, devices and therapies for the eradication of phytopathological problems. Among the known metal oxide nanoparticles, magnesium oxide nanoparticles (MgO NPs), due to their high chemical, thermal stability, non toxicity, eco-friendly nature and large surface area have been considered as a promising material for catalysis, industrial paints, against food borne pathogens, toxic waste remediation etc. Taking into account the mutation of pathogens and resistance against different pesticides and heavy costs of generating new and resistant races and also potential ability of nanoparticles, the antifungal effect of magnesium oxide nanoparticles was assessed in the research. Magnesium nitrate  $Mg(NO_3)_2$  and sodium hydroxide were used as precursors for synthesis of MgO nanoparticles using precipitation method. These dispersed nanoparticles were stabilized with capping agent viz. polyvinyl pyrrolidone (PVP). Prepared sample, was characterized by Transmission electron microscopy (TEM) which demonstrated MgO nanoparticles with the size range of 10-20 nm. Further characterization was done by UV-Visible Spectroscopy (UV-Vis), Atomic force microscopy (AFM), X-ray diffraction (XRD) and Scanning Electron Microscopy (SEM-EDS). The prepared sample of MgO NPs was evaluated against phytopathogenic fungus, *Fusarium moniliforme* by poisoned food technique. The  $ED_{50}$  value was 14 $\mu$ g/ml which was much higher than that of standard.

**Keywords:** MgO, Magnesium nitrate, sodium hydroxide, Nanoparticles, *Fusarium moniliforme*.