

Green Nanof ormulation: Potent Antimicrobials Against AMR Microbes Isolated From hospital Wastes †

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Abstract: Green nanotechnology a clean technology that enhances the environmental sustainability of processes producing negative externalities. It minimizes potential environmental and human health risks. Multidrug resistance is a serious hazard to the environment, claiming a large number of lives every year. Lack of drug options and easy transmission of these organisms remain the biggest threat towards treating the relative infections whose causative systems have evolved to become stronger in time. Hospitals remain one of the largest breeding grounds for harboring these organisms due to improper waste treatment methods and disposal. This study aims to isolate and characterize multidrug-resistant microorganisms from soil samples collected from hospital waste dumping premises and investigate various treatment options and their efficacy. Soil samples were collected from five hospitals around the city. 5 major colonies were isolated, and the DNA was sequenced. The isolated colonies were subcultured, and antibiotic susceptibility of these microorganisms under the influence of various antibiotics was observed. It was seen that all the microorganisms were multidrug-resistant and possessed resistance to various classes of antibiotics. , The efficacy of silver nanoparticles synthesized from ethnomedicinal sources, was treated against these strains, and it was observed that the silver nanoparticles were highly effective in inhibiting these microorganisms in comparison with commercial antibiotics. MIC, MBC, and biofilm assays were performed for further observation.

Keywords: green nanotechnology; multidrug resistance; DNA isolation; next generation sequencing; hospital waste; nanoparticles.

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Conflicts of Interest

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