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MYCOSYNTHESIS AND ANTIBACTERIAL ASSESSMENT OF GOLD AND SILVER NANOPARTICLES (NPS) AND FUNCTIONALIZED NPS USING BIOMOLECULES FROM PLEUROTUS OSTREATUS AGAINST SOME SELECTED MULTIDRUG RESISTANT PATHOGENS

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Biosynthesis and characterization of gold and silver nanoparticles (NPs) using biomolecules such as exopolysaccharide (EPS), cell free filtrate (CFF) and fruiting body extract (FBE) of *Pleurotus ostreatus* (PO) and antimicrobial potential of the biosynthesized NPs and functionalized NPs against some multidrug resistant bacteria was investigated. The silver NPs (SNPs) and gold NPs (AuNPs) biosynthesized using the biomolecules (EPS, CFF and FBE) were characterized using visual observation, UV-visible spectrophotometer, Fourier transform infrared (FTIR) and scanning electron microscope (SEM). Changes in colour from pale yellow and cloudy colour to dark brown and to purple and dark purple indicate the formation of SNPs and AuNPs. The intensity of the colour differs from CFF<EPS<FBE. The NPs had strong surface plasmon resonance (SPR) band at 500 nm and 400 nm after 72 hrs for AuNPs and SNPs. The NPs were polymorphic shape and aggregate. Hydroxyl, carboxyl and aldehydes were the major functional group present which may be responsible for the reduction, capping and stabilization of the NPs. The AuNPs and SNPs had antibacterial activity against the test pathogens and the zones of inhibition ranged from 9-27 and 8-29 mm. The ceftriaxone functionalized SNP and AuNP showed increased antimicrobial activity which ranged from 30-40 mm and 25-42 mm. Functionalization's of the NPs with antibiotics enhanced the antibacterial property of the NPs. In conclusion, this study demonstrated that biomolecules from *Pleurotus ostreatus* could be used for the production of stable SNPs and AuNPs with antibacterial activity against MDR pathogens. Functionalization improved the antibacterial potentials of the NPs.

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