

Applications of *Nigrospora sphaerica* mediated synthesized nanoparticles †

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† Presented at Virtual symposium to observe World Antimicrobial Awareness week “Applications of biotechnology and microbiology with special emphasis on Antimicrobial resistance”, 18-24 November 2020, Chennai, India

Received: 10.11.2020; Revised: 15.11.2020; Accepted: 17.11.2020; Published: 10.01.2021

Abstract: Endophytic fungi are microorganisms that live within the plant tissues without causing any harm to the plant and produce secondary metabolites similar to the compounds produced by the plant, which has various potential such as anticancer, antibacterial, and cytotoxic activity. Thus due to this unique property, the fungal extract is employed in the synthesis of silver nanoparticles. *Nigrospora sphaerica* is an endophytic fungus isolated from the leaves of *Russelia equisetiformis*. This fungal extract was used for silver nanoparticle synthesis (NsAgNps), and they were characterized by U-V spectrometry, and they were found to be at the peak of 425nm. The FT-IR results show the presence of compounds that stabilize and functionalize the nanoparticles. The FESEM results show that the nanoparticles are crystalline, and the polymorphous EDAX results show the presence of elemental silver and other compounds. The NsAgNps are known to have antioxidant activity and alpha-amylase inhibition activity. The molecular docking of alpha-amylase and the compound nigrosporin from the fungi *Nigrospora sphaerica* has a binding energy of -9.1kcal/mol and binds at the active site of the alpha enzyme. Thus the study focus on the various potential of the nanoparticles synthesized from endophytic fungi.

Keywords: endophytic fungi; nanoparticles; *Russelia equisetiformis*; *Nigrospora sphaerica*; nigrosporin.

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Funding

This research received no external funding.

Acknowledgments

The authors are thankful to B.S. Abdur Rahman Crescent Institute of Science and Technology for providing research facilities.

Conflicts of Interest

The authors declare no conflict of interest.