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"Synthesis Of Lemongrass Silver Nanoparticles (Lagnps) And It's Role In Preservation And Conservation Of Palm Leaves Manuscripts (Plms)".

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Abstract;

Silver nanoparticles (AgNPs) was synthesized from lemongrass extract, where lemongrass was dried and powdered. Then were soaked in sterile distilled water and boiled for 20minutes and filtered. The filtrate was employed for the synthesis of silver nanoparticles. The extract was coated to scripted Palm Leaf Manuscripts and observed for few months keeping one Palm Leaf Manuscripts as control without coating with the sample. In this study, lemongrass extract was successfully used to biologically synthesize AgNPs. In order to protect the PLM from harm and preserve it for both present and future use, preservation and conservation are related. Since it is nearly difficult to restore the old original manuscripts to their original state, they must be preserved. The knowledge concealed within the original documents will give research and development a new perspective. According to **'Constitution of India – 1950**, In Part IV-A under fundamental Duties in article 51A "It shall be the duty of every citizen of India-point no. (f**)** to value and preserve the rich heritage of our composite culture." (Govt. of India,2015.). Therefore, its everyone duty is to preserve the heritage of India by preserving the PLMs.

Key Words; Nanoparticles, Lemongrass, Palm leaves, Aspergillus, Fusarium.

1. Introduction;

Nanoparticles can serve as “magic bullets”, containing herbicides, nano-pesticide fertilizers, or genes, which target specific cellular organelles in plant to release their content (Manzer H. Siddiqui, Mohamed H. Al-Whaibi, Mohammad Firoz and Mutahhar Y. Al-Khaishany, “Role of Nanoparticles in plants”, Chapter · January 2015, © Springer International Publishing Switzerland 2015 M.H. Siddiqui et al. (eds.), Nanotechnology and Plant Sciences, DOI 10.1007/978-3-319-14502-0_2i).

Nanoparticles have unique physical and chemical properties due to their small sizes, and this enables them to be used for various novel purposes. The most important nanoparticles are the metallic nanoparticles because they have remarkable antibacterial properties as a result of their large surface area to volume ratio. Researchers are becoming very much interested in the antimicrobial effect of metallic nanoparticles because of the increasing development of resistance by microbes against antibiotics. Silver, gold, platinum nanoparticles are some of the metallic nanoparticles which have gained considerable attention in recent times due to their unique properties (Hadeel Salih Mahdi and Azra Parveen, “Synthesis and Characterization of Gold Nanoparticles (Au-NPs) using aqueous extract of Lemongrass”, International Journal of Technical Innovation in Modern Engineering & Science (IJTIMES) Impact Factor: 5.22 (SJIF-2017), e-ISSN: 2455-2585 Volume 4, Issue 11, November-2018).

2. Experimental Detail;

2.1.Synthesis of silver nanoparticles: To initiate the synthesis of silver nanoparticles, precisely 80 ml of 1 mM silver nitrate was added to 20 ml of the Lemon grass leaf extract. The reaction mixture was then left to incubate in a dark environment at room temperature for reduction process and to prevent the photoactivation of silver nitrate in static conditions. The shift in color from brown to yellow served as an indicator of silver nanoparticle formation.

2.2.Coating of scripted manuscripts with the extracts;

In continuation to this study further the scripted palm leaves are coated with samples (LGAE and LGNP) and kept for incubation at room temperature to observe fungal infection patterns, which will be observed for few months.

3. Conclusion and Future prospects;

This study demonstrates that the application of nanoparticle-based extracts is an effective preservation technique for palm leaf manuscripts. After 132 days- the white-colored infection was observed and part was cultured on PDA plates and kept for observation. After 4-5 days, plates with white colored hairy growth were observed and staining was done to identify. After staining **Aspergillus and Fusarium species** were identified. Control leaf shows exponential fungal growth over time. Treated leaves showed no visible infection, indicating some protective effect. Among the various treatments tested AgNPs showed notable antimicrobial activity, helping to prevent microbial deterioration and enhance the longevity of the manuscripts.

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Conflict of Interest; On behalf of all authors there is no conflict of interest.

Replication of Result; The result obtained in this work can be used in any other inhouse projects as a reference.

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