2024 MuseumPests & Pest Odyssey

DEVELOPING COMMERCIALLY VIABLE NANOBIOPESTICIDES USING HERBAL PLANTS FOR SUSTAINABLE PEST MANAGEMENT IN CULTURAL INSTITUTIONS

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Introduction

- Develop indigenous nano-biopesticides for commercialization.
- Synthetic chemical insecticides pose risks like toxicity, resistance, and pollution.
- Use nanoparticles and plant extracts for sustainable pest management.
- Nanoparticles loaded with natural compounds inhibit pests, extending artifact lifespan.
- Market demand for cost-effective pest solutions, offering entrepreneurial prospects.
- Nanobiopesticides offer high efficacy with minimal application and prolonged effectiveness without changing the aesthetic integrity.

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Addressing the Research Gap

- Underexplored Potential of Herbal Biocides
- Limited Integration of Traditional Methods
- Absence of Integrated Solutions
- Overreliance on Synthetic Chemicals
- Comprehensive Assessment of Synthetic Control Methods
- Adapting to Governmental Restriction
- Efficacy Analysis of Natural Products
- Novelty of Nanotechnology Application

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Objectives of the Research

- Develop commercially viable, environmental friendly nano-biopesticides.
- Introduce indigenous nano-biopesticides for pest control in cultural institutions.
- Promote traditional Indian conservation practices globally.
- Re-evaluate the validity of traditional methods integrating with cutting-edge nanotechnology for pest control.
- Explore the potential of nanomaterials for pest control in cultural institutions.
- Advocate for integrating traditional methods with nanotechnology in conservation strategies.

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Research Methodology

1. Synthesis of Nanoparticles
2. Extraction of Botanical Materials
3. Surface Functionalization of Nanoparticles
4. Preparation of Core-Shell Nanoparticles
5. Analysis of Efficacy and Safety
6. Characterization of Materials
7. Data Analysis and Reporting

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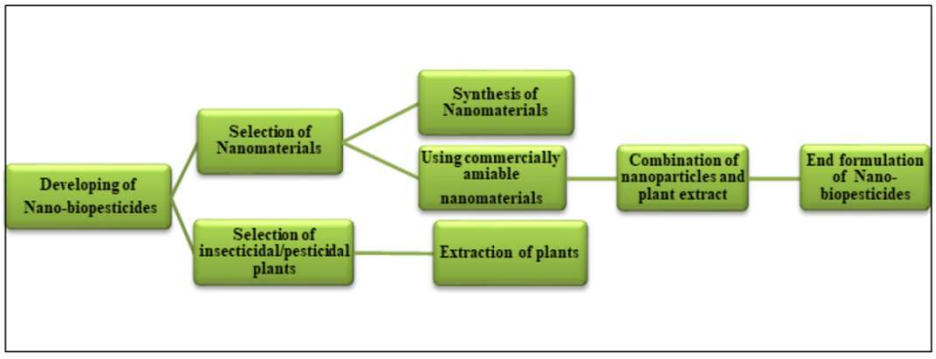

Figure 1. Representing the workflow of nano-biopesticides formulation

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Current status of the technology (including technology readiness)

- Limited focus in recent papers on plant extract-based nano-biopesticides.
- Previous studies mainly concentrate on nano-biopesticides for agricultural use, not adapted for the museum and conservation field.
- Established methods for nanomaterial synthesis and pesticide development, but the idea of developing nano-biopesticides is a recent exploration.
- Technology readiness level suggests the potential for success in this innovative approach.
- Synergizing nanoparticles with plant extracts shows promise for enhancing pesticidal/insecticidal properties.

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Expected Outcomes of the Proposal

- *Development of Sustainable and Culturally Sensitive Pest Management Solutions .*
- *Effective Nano-Biopesticides Coating, icreases the longevity of the artifact, specimen/collection.*
- *Identifying Low-Cost and Effective Technological Solutions.*
- *Highlights nanotechnology's promising future in the heritage and museum sector.*
- *Recognititon as a model for preservation of cultural heritage*

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Conclusions

- *Synthesis of Nanoparticles through Nanotechnology offers innovative, sustainable pest control method for cultural heritage.*
- *Our objectives prioritize environmental safety, promoting and integrating traditional knowledge, innovation, and preservation of cultual heritage globally.*
- *We're at the forefront of a global shift towards sustainable preservation of cultural heritage.*
- *International collaboration and knowledge sharing are key to overcoming challenges.*
- *Our meticulous approach, from nanoparticle synthesis to safety analysis, ensures comprehensive results,* promises not only effective results but also valuable contributions to the global scientific community.
- **This research is not merely about offering solutions; it's about leaving an enduring legacy.**

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References

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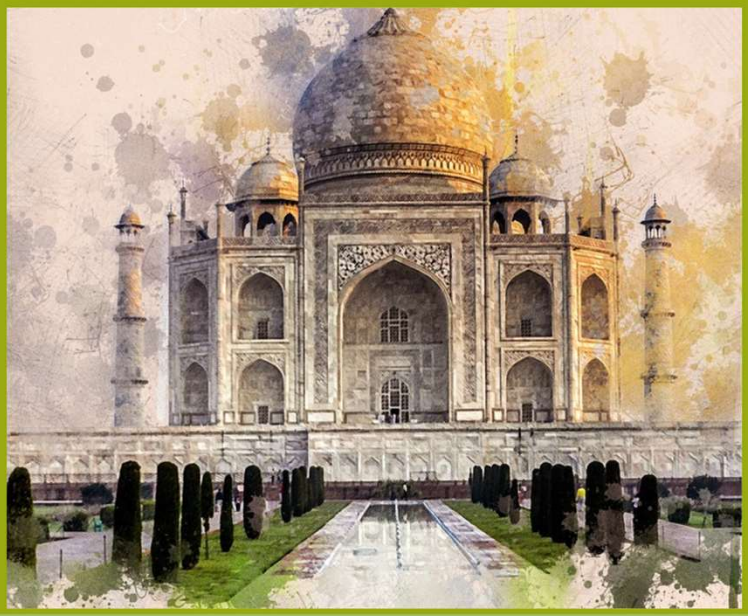

Thank you for listening!

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