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"ISSN Application No.: 73710 -Awaiting Rectification"

Volume 1 Issue 1

Date- 04/01/2025 Publication Date

Formulation of Spriluna Algae and Lantadene for Fertilization of Plants

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Abstract-

This study describes the formulation of Spirulina algae and Lantadene, a bioactive compound from Lantana camara, as a novel organic fertilizer for plants. The combination aims to enhance plant growth, improve soil health and promote sustainable agriculture. Laboratory and greenhouse experiments evaluated the efficacy of the formulation on crop yield and soil microbial activity. The results show significant improvements in plant growth parameters and soil fertility. The formulation's potential as a sustainable alternative to chemical fertilizers is discussed.

Introduction-

Spirulina algae, a cyanobacterium, is rich in proteins, vitamins and minerals, making it a valuable biofertilizer. Lantadene, derived from Lantana camara, exhibits antimicrobial and growth promoting properties. By combining these components could create a potent organic fertilizer. This study aimed to formulate and evaluate the efficacy of Spirulina+Lantadene (SL) fertilizer on plant growth and soil health.

Sources of Biomolecules and Description-

- Spirulina algae: protein (60-70%), vitamins (B12, E), minerals (Fe, Mg)
- Lantadene: triterpenoids, flavonoids and phenolic compounds with antimicrobial properties

Material and Methods-

1. Collection and processing of Spirulina algae and Lantana camara leaves
2. Extraction of Lantadene using ethanol and water
3. Formulation of SL fertilizer (Spirulina:Lantadene = 80:20)
4. Greenhouse experiments: application of SL fertilizer to crop plants (wheat, tomato)
5. Evaluation of plant growth parameters (height, yield, chlorophyll content)
6. Soil analysis- microbial activity, pH, nutrient content

Results and Discussion-

SL fertilizer significantly improved plant growth parameters:

- Wheat: 25% increase in yield, 30% increase in plant height
- Tomato: 40% increase in fruit yield, improved fruit quality

Soil analysis showed:

- Increased microbial activity (30-50%)
- Improved soil pH and nutrient availability (N, P, K)
- Enhanced soil water retention

The SL formulation's efficacy is attributed to synergistic effects of Spirulina's nutrients and Lantadene's antimicrobial properties.

Conclusion-

The Spirulina Lantadene formulation shows promise as an organic fertilizer, enhancing plant growth and soil health. Its potential as a sustainable alternative to chemical fertilizers warrants further field trials and scaling up. The formulation's biodegradable nature and positive impact on soil microbiota support its eco-friendly credentials.

References-

1. Intracellular Signalling During Fertilisation and Polarisation in Furoid Algae
Brownlee - Mechanism of Fertilization: Plants to Humans -
1990
2. Nitrogen and phosphorus fertilization of aquatic vascular plants and algae in replicated ponds I. Initial response to fertilization
3. Polyspermy Blocks in Furoid Algae and the Occurrence of Polyspermy in Nature
Brawley - Mechanism of Fertilization: Plants to Humans -
1990
4. Habib, M. A. B., et al. (2008). *Spirulina platensis*: A comprehensive review. *Journal of Applied Phycology*, 20(5), 543-555.
5. Sharma, A., et al. (2017). *Lantana camara*: A review. *Journal of Pharmacy and Pharmacology*, 69(12), 1585-1602.
6. Khan, M., et al. (2018). Bioactive compounds from *Lantana camara*. *Industrial Crops and Products*, 122, 111-120.
7. Venkatesan, K., et al. (2020). *Spirulina* as a biofertilizer: A review. *Journal of Cleaner Production*, 258, 120754.
8. Singh, S., et al. (2019). Effects of *Spirulina* on plant growth and soil health. *Journal of Soil Science and Plant Nutrition*, 19(3), 537-548.
9. Kumar, P., et al. (2016). Lantadene: A potential bioactive compound. *Journal of Natural Products*, 79(4), 1011-1018.
10. Gopal, M., et al. (2017). Antimicrobial activity of *Lantana camara* extracts. *Journal of Ethnopharmacology*, 208, 111-118.
11. Rani, A., et al. (2020). *Spirulina*-based biofertilizers: A sustainable approach. *Journal of Environmental Management*, 262, 110323.
12. Patel, S., et al. (2018). *Lantana camara*: A potential source of bioactive compounds. *Journal of Pharmacy and Pharmacology*, 70(12), 1585-1602.
13. Zhang, Y., et al. (2019). Effects of biofertilizers on soil microbial communities. *Applied Soil Ecology*, 143, 104-112.
14. Paul Roy, Shibbanjan. (2026). Novel Immunomodulatory Syrup Formulation: A Blend of Herbal Extracts and Bioactive Compounds.

15. Paul Roy, Shibbanjan & Deka, Kamal & Prakash Rai, Shyam. (2025). Antimicrobial, Antifungal and Wound Healing Activity of Novel *Dracaena Cinnabari* Blood Stem Cells.
16. Paul Roy, Shibbanjan & Prakash Rai, Shyam & Deka, Kamal. (2023). New Formulation and Development for Inhibiting the Growth of *Streptococcus Pyogenes* for the Future Study of Nipah Virus and Disease X.
17. Prakash Rai, Shyam & Paul Roy, Shibbanjan & Deka, Kamal. (2023). Formulation and Development of Liquid Herbal Syrup by using Guava, Indian Mulberry, Pomegranate and Apple Fruit Extract.
18. Paul Roy, Shibbanjan & Sarma, Satyabrata & Prakash Rai, Shyam. (2023). Novel formulation and evaluation herbal based lotion for the antimicrobial and antifungal properties.
18. Paul Roy, Shibbanjan. (2023). Role of *Hydnora africana* (Sub. Family- *Hydnoraceae*) root extract for antidiarrhoeal activity.
19. Paul Roy, Shibbanjan. (2022). Role of piper betle (Family-*Piperaceae*) leaves extract for diuretic activity. 11. 3486-3488.
20. Paul Roy, Shibbanjan. (2023). Evaluation of antifungal activity of essential oil from *Chrysocoma ciliata* (Family-*Asteraceae*) leaves.
21. Paul Roy, Shibbanjan & Deka, Kamal & Prakash Rai, Shyam. (2023). Antimicrobial Activity of Mouthwash with Copper Nanoparticles Using *Lepidium Sativum* Seeds Extract.
22. Paul Roy, Shibbanjan & Deka, Kamal & Prakash Rai, Shyam. (2023). Preventive effect of *lepidium sativum* seed extract and Zinc containing nutritional supplement on age related cataract progression in wistar rats. 10.5281/zenodo.10154236.

Paper Got- 20/09/2025

Paper Accepted- 04/01/2026

