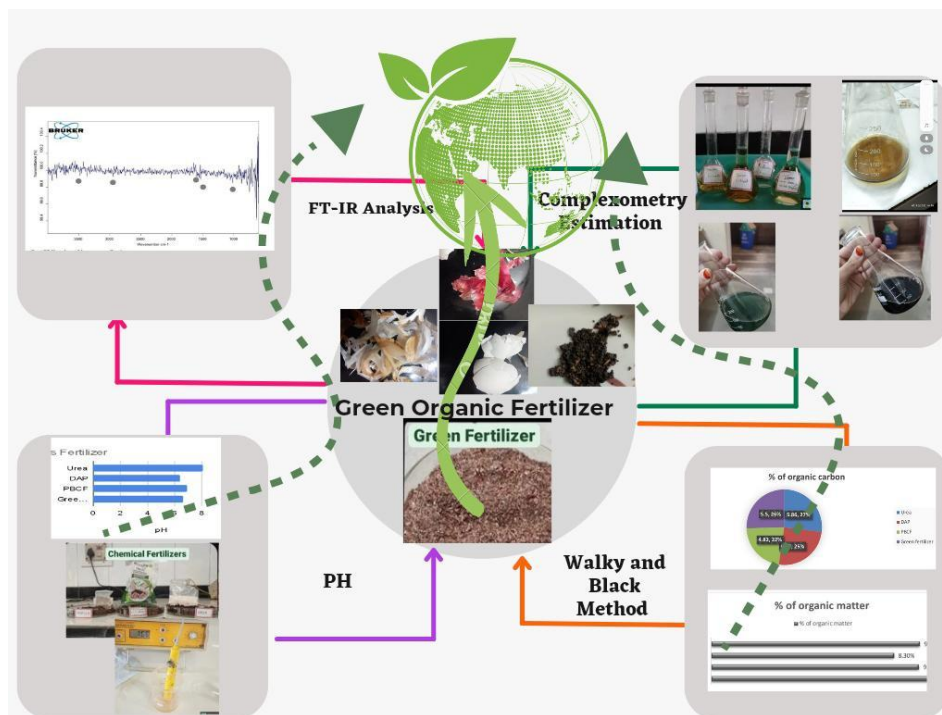


Synergistic Enrichment: Unveiling the Chemistry Behind a Formulated Green Organic Fertilizer for Sustainable Soil Enhancement

Ms. Tahreem Ashraf Momin¹, Dr. Naheed Azam, Dr. Jayashree Thakre, Dr. Shaziya Momin,
Dr. Seema I. Habib, Ms. Sidrah Shahbaz², Ms. Saira Siraj Ahmed²,
Ms. Arhama Tanveer², Ms. Maryam Mahmood²
Assistant Professor, Department of Chemistry^{1,2}
Associate professor, Department of Chemistry²
K. M. E. Society's G. M. Momin Women's College, Bhiwandi, Thane, India

Abstract: This research focuses on the global challenge of increasing crop production sustainably, emphasizing the environmental impact of excessive fertilizer use. In this research we introducing a novel green organic fertilizer prepare from *Allium cepa* (Onion) and *Allium sativum* (Garlic) peels, *Camellia sinensis* (Tea) leaves waste, and eggshell. The study employs methods like complexometric titration and FT-IR spectroscopy to highlight its nutrient-rich composition and positive impact on soil quality. The study revealed the potential of Green organic Fertilizer to improve the balanced soil, maintain the optimal pH, and significantly increase organic matter and carbon content. The study advocates its integration into traditional farming practices and presents it as a flexible and sustainable method of promoting healthy soils rich in nutrients. The fusion of essential metal ions and organic components in this fertilizer provides a holistic approach to soil enrichment and promises a greener and more productive agricultural future.

Graphical abstract:



Keywords: Green Organic fertilizer, comparative estimation of green fertilizer with chemical fertilizers, organic content in soil, complexometric estimation