PRODUCTION OF BIOFILM FERTILIZER FROM MICROORGANISMS ISOLATED FROM BATTICALOA DISTRICT

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ABSTRACT

The aim of this research is the preparation of biofilm biofertilizer using soil nitrogen-fixing bacteria and phosphorus solubilizing fungi isolated from the Eastern University premises. The laboratory experiment was carried out in the Microbiology laboratory, Faculty of Technology, Eastern University, from the period of November 2024 to March 2025. Isolation of nitrogen-fixing and phosphorus-solubilizing soil microorganisms was done using the azotobacter medium and Pikovskaya's agar medium. Purified forms of nitrogen-fixing bacteria and phosphorus solubilizing soil fungi were cultured using Nutrient Agar (NA) and Potato Dextrose Agar (PDA) culture media to prepare stock cultures. Then they were cultured in yeast mannitol agar for an inhibition check. Bacterial and fungal isolates which are not inhibit each other were cultured in Yeast mannitol liquid medium. A total of three purified forms of nitrogen-fixing bacteria, namely, NS1aC1, NS1bC2, and NS2bC4 and a total of three purified phosphorus solubilizing fungi, PS1aC1, PS1aC2, and PS2bC4, were identified in this study and PS1aC2, PS2bC4, NS1bC2, NS2bC4 were used to prepare biofilm biofertilizer. Purified cultures of NS1aC1, PS1aC1 showed inhibition.

All the purified bacteria were found to be gram-positive (purple colour) in the Gram-staining test. Gram stains, cultures and biofilm were observed for morphological characterization under the High-performance light microscope.

Colony characteristics (colour, form, elevation, margin) in fungi and cell characteristics (Gram status) were tested in bacteria. Further study is required to examine the impact of these nitrogen-fixing and phosphorus-solubilising soil fungi biofilm biofertilizer on the yield before application as a fertilizer.

Suggestion, Development of suitable carrier material for field application and check the effectivity of nitrogen fixing and phosphorus solubilizing of this biofilm.

Keywords: Azotobacter, biofilm, Biofertilizer, Colony, Gram staining test, Isolates, Laboratory, inhibition, Microbiology, Microorganisms, Nitrogen fixing bacteria, Phosphorus solubilizing bacteria, clear zone.

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