ISOLATION AND IDENTIFICATION OF NITROGEN-FIXING AND PHOSPHORUS-SOLUBILIZING SOIL BACTERIA ASSOCIATED WITH VEGETABLE CULTIVATION IN THE 'KARAITIVU' AREA

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ABSTRACT

The aim of this research is the Isolation and identification of nitrogen-fixing and phosphorous-solubilizing soil bacteria associated with vegetable cultivation in the 'Karaitivu' area. The laboratory experiment was carried out in the Microbiology laboratory, Faculty of Technology, Eastern University from the period of March 2024 to June 2024. 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 and phosphorus solubilizing soil bacteria were isolated using NA media. Accordingly, a total of 9 Nitrogen-fixing soil microorganisms (NSICI, NSIC2, NSIC3, NS2C1, NS2C2, NS2C3, NS3C1, NS3C2, NS3C3), and 9 phosphorous solubilizing soil microorganisms (PSICI, PSIC2, PSIC3, PS2C1, PS2C2, PS2C3, PS3C1, PS3C2, PS3C3) were isolated from the home garden, organic farm, and inorganic farm in 'Karaitivu area'. All the isolated microbes have rod-shaped cells. Nitrogen-fixing microbes and phosphorus solubilizing microbes were isolated from various vegetable-cultivated soil samples (home garden, organic farming, inorganic farming). A total 5 purified forms of nitrogen-fixing bacteria (NSICa, NS1Cb, NS2Ca, NS2Cb, NS3Ca) and 5 purified forms of phosphorous solubilizing bacteria were selected to study (PS1Ca, PS1Cb, PS2Ca, PS2Cb, PS3Ca) the morphology further. All the purified bacteria were found to be gram-positive (purple color) in the gram-staining test. Gram status was observed under the fluorescence microscope.

Morphological characterization results showed in terms of colony characteristics (color, form, elevation, margin, colony numbers) and cell characteristics (Gram status). Morphological characteristics were observed by Stereo microscope. Further study is required to examine the impact of these nitrogen-fixing and phosphorous-solubilizing bacterial isolates on the yield before application as a biofertilizer.

Keywords: Azotobacter, Biofertilizer, Colony, Gram staining test, Isolates, Laboratory, Microbiology, Microorganisms, Nitrogen fixing bacteria, Phosphorous solubilizing bacteria

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