Abstract

Qualitative Assessment of Beneficial Microorganisms

Iuliana RĂUT, Mariana CĂLIN, Ana-Maria GURBAN, Mihaela DONI, Melania-Liliana ARSENE, Gelu VASILESCU and Luiza JECU *

National Institute for Research & Development in Chemistry and Petrochemistry-ICECHIM, Biotechnology Department, 202 Independentei Spl., 060021 Bucharest, Romania; iulia_rt@yahoo.com (I.R.); marriconstantin@yahoo.com (M.C.); amgurban@yahoo.com (A.-M.G.); mihaela.doni@icechim.ro (M.D.); melania_arsene@yahoo.com (M.-L.A.); gelu_gvp@yahoo.com (G.V.)

* Correspondence: jecu.luiza@icechim.ro
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Modern agriculture needs various plant growth stimulant products. Biostimulants are a relatively new group of products with beneficial effects. They enhance plant nutrition and tolerance to the abiotic stress, and also improve the crop quality [1,2]. One type of biostimulant are microorganisms, including beneficial bacteria—mainly plant growth-promoting rhizobacteria (PGPRs), and beneficial fungi. The aim of this study was to screen fungal isolates—potential candidates for biostimulation of plant growth and the biocontrol of pathogens.

Several fungal strains belonging to Hyphomycetes were tested for characteristics representative for a beneficial microorganism: Production of extracellular enzymes (chitinases, cellulases, keratinases), phosphorus solubilization, siderophores and indole acetic acid (IAA) production. Also, the efficacy of tested strains as biocontrol agents against plant pathogens was achieved by antagonism, with double-culture method [3].

Positive results were obtained in the antagonism test. Two Trichoderma and one Paecylomyces isolates showed a significant inhibitory effect on pathogen growth. Production of lytic enzymes was more or less at the same level for all tested strains. It is important to highlight that the selected strains presented the ability to produce IAA, the most common plant hormone responsible for cell division and elongation as a response to various factors, such as light and the presence of pathogens etc.

The use of selected fungal isolates could be of practical interest for promoting plant growth and reducing nitrogen fertilizers. Further researches are required for an understanding of the action mechanisms of biostimulation on plants.

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