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**CHEMICAL SUBSTANCES PRODUCED BY SELECTED  
MICROORGANISMS AND THEIR BIOFILMS**

A PROJECT REPORT PRESENTED BY

**IRANTHI KAUSHALYA INDRASENA**

to the Board of Study in Chemical Sciences of the

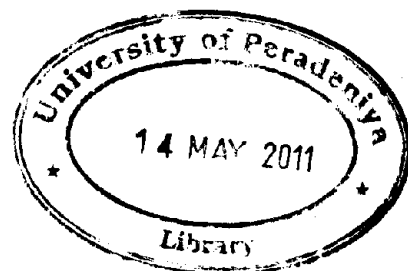
**POSTGRADUATE INSTITUTE OF SCIENCE**

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**ABSTRACT****CHEMICAL SUBSTANCES PRODUCED BY SELECTED  
MICROORGANISMS AND THEIR BIOFILMS****I. K. Indrasena**

Post Graduate Institute of Science

University of Peradeniya,

Peradeniya,

Sri Lanka.

The search of new antimicrobial compounds has progressed in recent years, with the screening of several thousands of biologically active compounds. Antimicrobial organisms can be found in a variety of soil environments and they have an advantage because they can kill off other microbes in that environment.

*Penicillium* is a fungus abundant in soils. They form biofilms with  $N_2$  fixer; cells of the  $N_2$  fixing bacteria attach to the mycelial mats of the fungus forming a biofilm. The major objective of this study was to isolate antimicrobial compounds from the microbes and biofilm and to check their phosphorous solubilizing activity and production of plant growth promoters (Indole Acetic Acid like substances) using spectrophotometric method.

Microbial metabolites were isolated from *Penicillium sp.*,  $N_2$  fixing bacteria and biofilm by solvent extraction and they were tested for activity against pathogenic microorganisms using disk diffusion method. All three isolates did not show any antimicrobial activity on tested microorganisms. The biofilm showed higher P solubilization activity. It may be due to acid production of the biofilm. Also, it showed high concentrations of formation of IAA like substances than the single microorganisms which were used to form the biofilm.

Attachment of microbes on biotic or abiotic surfaces to form biofilm structures has a great impact on biodegradation and biosynthesis in nature. Further studies of any microbial combination of biofilms can be tested for new antimicrobial compounds.