INVESTIGATION ON BIOFILM FORMATION STAGES IN SOME STRAINS OF *Pseudomonas fluorescens* AND THE INFLUENCE OF SOME NUTRITIONAL FACTORS ON BIOFILM FORMATION OF SELECTED STRAIN *

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(Received: 29. 10 .2010; Accepted: 29. 7. 2011)

Abstract

Biofilm formation on abiotic surfaces initiates in response to environmental cues, and the same is true for attachment to the plant surfaces. In this study the detection of biofilm formation of some *Pseudomonas fluorescens* strains was done indirectly by determining the extent of CV-stained cells attached to a surface. *Pseudomonas fluorescens* UTPF98 was selected because of its great ability of biofilm formation. And then the stages of biofilm formation (reversible and irreversible attachment, microcolony formation and macrocolony formation with exopolysacharid (EPS) production) in mentioned strain was investigated on glass slides. At last the effect of some nutritional factors like cations (Mg^{2+}, B^{3+}, Cu^{2+}, Co^{2+}, Mo^{6+}, Zn^{2+}, Mn^{2+}, Ca^{2+} and Fe^{2+}), carbon sources (arabinose, rhamnose, glucose, mannose, galactose and xylose), aminoacids (aspartic acid, asparagine, phenylalanine, leucine, threonine, proline, glutamic acid, glutamine, arginine, tyrosine, histidine, alanine, lysine, isoleucine and glycine) and phosphorus on biofilm formation was investigated in this study. Cations had various effects on biofilm formation. All carbon sources and aminoacids tested promoted biofilm formation. In contrast, phosphorus reduced biofilm formation. These results clearly show that nutritional status of the medium can influence biofilm formation in vitro. For successful biocontrol by fluorescent pseudomonads, one needs to understand which and how nutritional status affects the biofilm formation in potential biocontrol products.

Keywords: Biofilm, *Pseudomonas fluorescens*, Nutritional factors.

See Persian text for figures and tables (Pages ۴۶۳-۴۷۰).

*: A Part of MSc. Thesis, Submitted to College of Agriculture and Natural Resources, University of Tehran, Tehran, Iran.

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