

Optimization of Culture Condition by Response Surface Methodology for Poly(γ -glutamic acid) Production by *Bacillus* sp. RKY3

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Poly(γ -glutamic acid) (γ -PGA) is an unusual anionic polypeptide, consisting of glutamic acid units that are polymerized via amide linkages between the α -amino and γ -carboxylic acid functional groups. γ -PGA, which has been considered a promising biodegradable polymer, is a naturally occurring, water-soluble, and edible compound, which is also non-toxic in both the human body and the general environment. There has been a great deal of interest in γ -PGA and its derivatives in a wide range of industries, including food, cosmetics, medicine, and water-treatment, as they may prove useful in a broad range of applications. The statistical methodologies are preferred because of various advantages in their use. Response Surface Methodology (RSM) is an efficient experimental strategic tool to obtain optimum conditions for a multi-variable system. In this study, to optimize culture condition for production of γ -PGA by statistical approach, the RSM was employed taking various carbon, nitrogen, mineral sources, and the other factors such as temperature, pH, and agitation speed via batch cultures of *Bacillus* sp. RKY3.