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Production of polyglutamic acid by *Bacillus* sp: strains selection, optimization, batch fermentation and characterization

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Polyglutamic acid (PGA) is an anionic, non-toxic natural polymer that consists of D- and L-glutamic acid. Glutamic acids that makeup PGA create bonds between α-amino and γ-carboxyl groups. PGA can be found on the surface of many different bacteria, usually as a part of their capsule. Bacteria use polyglutamic acid to survive adverse environmental conditions. PGA has found multiple potential applications as a thickener, drug carrier, biological adhesive, heavy metal and basic dye adsorber, etc. Its biodegradability is especially useful in the fields of food, cosmetics, medicine and water treatment[1]. The aim of this study was to find the best polyglutamic acid producer from the selection of 50 different *Bacillus* sp strains originating from Serbia, as well as the optimal medium composition. It was discovered that the best PGA producing strain was 17B and it was selected for further fermentation medium optimization. Optimization was carried out using Design of Experiment, specifically Box Behnken design. Results were analyzed using response surface methodology. PGA that was produced during this process was analyzed using SDS PAGE and basic dye adsorption was attempted as well. The best PGA producer, *Bacillus* sp strain 17B, was used for PGA production in batch fermenter [2]. PGA isolated from the fermentation broth was purified using gel filtration and further characterized using SDS PAGE, FTIR spectroscopy and direct-infusion MS.

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