

Enhancement of protease production by the optimization of *Bacillus subtilis* culture medium.

ABSTRACT

Aims: Traditionally, crustacean wastes have been managed by using acid and alkali which leads to major environmental issue. However, over the recent years microbial fermentation has gained its way whereby producing similar effects as chemical treatment and a higher quality product can be obtained. Extracellular protease from *Bacillus subtilis* was used further by optimizing its culture medium to enhance protease production. **Methodology and Results:** The culture media was optimized with 4 various sources; Shrimp Crab Shell Powder (SCSP), nitrogen sources, inorganic salts, and carbon sources. It was found that culture media supplemented with 9% SCSP, 3% yeast extract, 1% sodium chloride and 9% glucose augmented protease activity up to 565.80 ± 19.41 U/mL compared to the un-optimized media (170.57 ± 6.75 U/mL). By using this optimized media, the ability and efficiency of *B. subtilis* in a period of 6 days was investigated whereby acid treated shrimp shells (ATSS) and raw shrimp shell powder (RSSP) were used in substitution of SCSP. In a period of 6 days, the protein content in both ATSS and RSSP was found to have been removed up to 60% and 42% respectively. However deproteinization was found to be more efficient in RSSP with the ratio of tyrosine to protein remained constantly high throughout the 6 days period. **Conclusion, significance and impact of study:** A better, more efficient and environmental friendly method is continuously being improvised to manage shrimp wastes with the use of microbes.

Keyword: *Bacillus subtilis*; Deproteinization; Shrimp; Fermentation.