The effect of glucose concentration and inoculation level on chitin extraction from shrimp waste using microbial fermentation

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Abstract
Chitin is one of the most abundant renewable polysaccharides in nature which is widely found in the shell of the crustacean, insect cuticle and cell walls of fungi. Due to the unique properties such as biocompatibility, biodegradation and non toxicity, it is widely used in various industries. In this study, Banana shrimp, Penaeus merguinsis wastes were utilized (particle size 8-10 mm) to extract chitin using microbial fermentation method by Pseudomonas aeruginosa. Demineralization and deproteinization was carried out by incubating shrimp waste inoculated with bacteria at different concentration of glucose (0%, 10%, 15% and 20% w/v) and inoculum (10%, 15% and 20% v/v) for 4 day in a shaking incubator (100 rpm) at 30°C. The results showed a direct correlation between the concentration of these parameters and deproteinization and demineralization rate. When studying the effect of these parameters, 20% glucose and 20% of the inoculum was determined as the optimum value, which leads to the production of chitin with a removal of minerals (76%) and protein (86%). Therefore, the microbial fermentation can be used as an ecofriendly and positive method to produce a high-quality chitin.

Keywords: Microbial Fermentation, Chitin, Banana Shrimp.