

Conference Paper

Characterization of *Bacillus megaterium* and *Bacillus mycoides* Bacteria as Probiotic Bacteria in Fish and Shrimp Feed

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Abstract

This study was aimed to identify probiotic characteristics and to test the cellulolytic ability of *Bacillus megaterium* and *Bacillus mycoides* bacteria for probiotic microbe candidates in fish and shrimp feed. The description of the cellulolytic and amylolytic abilities of these bacteria was obtained by non-experimental method and descriptive analysis. Probiotic characteristic identification includes growth curve was obtained through total plate count method, cellular and colony morphology, and cellulase and amylase enzyme activity test using DNS method. Results indicated that the maximum growth of *B. megaterium* was observed after six hours at 35.62×10^{10} (CFU), while *B. mycoides* was after 30 hours at 42.6×10^{10} (CFU). The macroscopic observation showed that the colony of *B. megaterium* was concave and smooth, while *B. mycoides* was flat, relatively rough, with silken threads around the colony. Both bacteria had milky white color, bacillus shape, Gram positive, and sporous. The activity of cellulose and amylase enzymes in *B. megaterium* were 3,974 units/ml and 1,831 units/ml, respectively. The activity of cellulose and amylase enzymes in *B. mycoides* were 3,506 units/ml and 3,730 units/ml, respectively. It can be concluded that both bacteria could be proposed as probiotic bacteria in fish feed.

Keywords: Characterization, *Bacillus megaterium*, *Bacillus mycoides*, probiotic microbes, feed.

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1. Introduction

The application of probiotics in fish and shrimp culturing has been utilized as a means of controlling diseases, increasing response of physical immunity, contributing nutrients and enzymes to the hatcher's digestive system and improving water quality [1]. Supplementation of probiotics may reduce epidemic of disease by improving the immune system of the fish and shrimp [2] and may further reduce the cost of culturing by increasing the growth and efficiency of fish feed [3]. Effective utilization of microbes