

Survival and Retention of the Probiotic Properties of Bacillus sp. Strains under Marine Stress Starvation Conditions and Their Potential Use as a Probiotic for Aquaculture Objectives

Authors : Abdelkarim Mahdhi, Fdhila Kais, Faouzi Lamari, Zeineb Hmila, Fathi Kamoun, Maria Ángeles Esteban, Amina Bakhrouf

Abstract : Aquaculture is the world's fastest growing food-production sector. However, one of the most serious problems regarding the culture of marine fishes is the mortality associated with pathogenic bacteria that occurs in the critical phases of larval development. Conventional approaches, such as the use of antimicrobial drugs to control diseases, have had limited success in the prevention or cure of aquatic diseases. Promising alternatives to antibiotics are probiotics, which are food supplements consisting of live microorganisms that benefit the host organism. In the search for more effective and environmentally friendly treatments with probiotics against pathogenic species in shrimp larval culture, the probiotic properties of Bacillus strains isolated from Artemia culture such as antibacterial activity, adhesion, pathogenicity, toxicity and the effect of marine stress on viability and survival were investigated, as well as the changes occurring in their properties. Analyses showed that these bacteria corresponded to the genus Bacillus sp. Antagonism and adherence assays revealed that these strains have an inhibitory effect against pathogenic bacteria in vitro and in vivo conditions and are fairly adherent. Challenge tests performed with Artemia larvae provided evidence that the tested Bacillus strains were neither pathogenic nor toxic to the host. The tested strains maintained their viability and their probiotic properties during the period of study. The results suggest that the tested strains have suffered changes allowing them to survive in seawater in the absence of nutrients and outside their natural host, identifying them as potential probiotic candidates for Artemia culture.

Keywords : bacillus, probiotic, cell viability, stress response

Conference Title : ICEBB 2014 : International Conference on Emerging Biosensors and Biotechnology

Conference Location : Paris, France

Conference Dates : December 30-31, 2014