

Isolation, Identification and Preliminary Characterization of Candidate Probiotic Bacteria from the Intestine of Domesticated Goldfish (*Carassius auratus*)

ABSTRACT

Aquaculture faces challenges from the emergence of many different diseases. For many years, these diseases, especially those caused by bacterial pathogens, were often treated using antibiotics, but due to rampant use of these drugs, many antibiotic-resistant pathogens have emerged. Besides market rejection, aquaculture products with high amounts of antibiotic traces can, in one way or another, harm consumers, and this has become a serious issue pertaining to food safety. In recent years, research on the use of probiotics has shown them not only to control fish diseases but also improve growth performance of farmed fish. Therefore, this study was undertaken to screen for bacteria with probiotic properties from the intestine of domesticated goldfish (*Carassius auratus*). A total of 169 bacterial isolates were tested for antagonistic properties towards selected fish bacterial pathogens using the disc diffusion method. Five bacterial strains with high antagonistic activity were selected for identification and evaluation of their probiotic capability against *Streptococcus agalactiae*, *Aeromonas caviae*, *Aeromonas hydrophila*, *Aeromonas salmonicida*, *Vibrio harveyi*, *Vibrio parahaemolyticus*, *Vibrio alginolyticus* and *Photobacterium damsela*. The bacterial strains included *Alcaligenes faecalis*, *Staphylococcus saprophyticus*, *Bacillus thuringiensis*, *Enterobacter cloacae* and *Skermanella stibiirensistens*. Of all the bacterial strains, *B. thuringiensis* showed a wide range of antagonistic activity towards fish pathogens, highest growth rate (0.34 %) with shortest doubling time (204 seconds) and survived through all the extreme environmental challenges (low acid, high bile and temperature). It seems that *B. thuringiensis* has more advantages than the other bacterial strains, and is assumed to have better probiotic potential. However, study to determine the beneficial effect of *Bacillus thuringiensis* in probiotic formulation requires further investigation.