

Lactococcus lactis AS A POSSIBLE BIOCONTROL AGENT AGAINST OPPORTUNISTIC PATHOGENS IN FRESHWATER AQUACULTURE

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Genus *Aeromonas* is known to contain opportunistic pathogens, which can sometimes cause the aeromoniasis when fish are subjected to stressful conditions. In such cases, antibacterial drugs are usually used to treat bacterial diseases of fish. However, pathogenic bacteria often develop drug resistance in response to long-term exposure to antibacterial drugs that makes infections more difficult to treat. An alternative to antibiotic treatment that has generated considerable interest is the use of probiotics. In this study, therefore, we examined the antibacterial effect of the intestinal bacteria from the Amur catfish *Silurus asotus* against aeromonads.

Intestinal bacteria were isolated from intestinal tracts of the Amur catfish and examined for their ability to produce antibacterial substances against five *Aeromonas* species. As a result, *Lactococcus lactis* was chosen as an active bacterium (Fig. 1). When this bacterium was cultured in a liquid medium at 25°C, concentrations of H₂O₂ reached ca. 50 mmol/l at 48 hr, while pH values remained stable at around 7 during the experiment lasting 72 hr. Antibacterial activity was clearly inhibited by catalase. *A. hydrophila* and *A. caviae* were both susceptible to H₂O₂ and were killed completely at concentrations of more than 70 and 40 mmol/l, respectively. These results strongly suggested that the antibacterial substance produced by *L. lactis* strain is H₂O₂.

These results suggest that the *Lactococcus lactis* strain is an excellent candidate for the biocontrol agent of opportunistic pathogens.

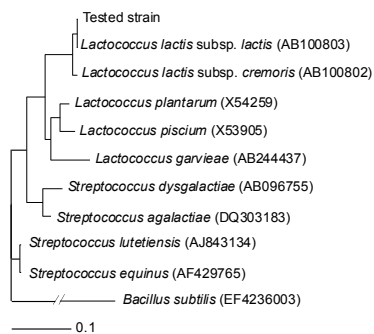


Fig. 1. Phylogenetic tree based on partial 16S rDNA sequence of a tested strain and related organisms.