Characterization and Identification of Bacteriocin-Like Substances Producing Lactic Acid Bacteria from the Intestine of Freshwater Crayfish, Cherax quadricarinatus

ABSTRACT

Redclaw crayfish, Cherax quadricarinatus is a valuable species for aquaculture. However, bacterial disease is an important obstacle, thus, currently, conventional treatment using antibiotic is prohibited. In order to control bacterial disease, alternative treatment is crucial for crayfish aquaculture. One of the potential alternatives is bacteriocin or Bacteriocin-Like Substances (BLIS). Hence, the objective of this study is to identify the Lactic Acid Bacteria (LAB) which is able to produce bacteriocin-like substances from freshwater crayfish, Cherax quadricarinatus. The enumeration of LAB in C. quadricarinatus is 1.21x107 CFU/g. Fifty-four isolates were successfully isolated using MRS agar and screened for their antagonistic activity against Aeromonas hydrophila. Twenty-one or 38.89 % of LAB isolates exhibited antagonistic activity against A. hydrophila and therefore categorized as BLIS producing strains. The morphological and phenotypic characteristics revealed six different groups of LAB. The identities of six representative BLIS producing LAB (CQ19, CQ20, CQ21, CQ41, CQ42, and CQ53) were confirmed by 16S rRNA gene sequencing. These representatives were identified as Enterococcus faecalis CQ19, E. faecalis CQ20, E. faecalis CQ21, E. faecalis CQ41, E. faecalis CQ42 and Lactobacilus plantarum CQ53. These LABs were able to produce bacteriocin-like substances, illustrating their potential activity in disease control in crayfish aquaculture.