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Probiotic characteristics and antimicrobial activities of LAB isolated from fish products

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Objective: The objectives of this study were to isolate LAB from fish products in UAE and investigate their probiotic characteristics. This study aimed also to characterize the isolated LABs which possessed bio-preservative (bacteriocin) properties.

Method: Physiological properties, cell surface properties (hydrophobicity, auto-aggregation, and co-aggregation), acid and bile tolerance, bile salt hydrolysis, cholesterol removing, exopolysaccharide (EPS) production, haemolytic, resistance toward lysozyme and six antibiotics were examined. The rRNA sequencing was carried out to identify the LAB isolates and to acquire Genbank accession numbers. The antimicrobial activity of the neutralized cell-free supernatant (NCFS) of 39 LAB isolates was tested according to referred method. Selected LABs were employed to product fermented fish sausages (FFS). The health-promoting benefits (antioxidant, antihypertensive and cytotoxicity) of the FFS were examined.

Results: Thirty nine LABs were isolated and identified as Enterococci, Lactobacilli and Streptococci. Virulence genes for Enterococci were tested and found safe. In general, all identified LAB (Lactococcus lactis KX881768, Lactobacillus plantarum KX881772, Lactococcus lactis KX881782 and Lactobacillus plantarum) showed auto-aggregation ability, high cholesterol removal ability, high co-aggregation, and strong antimicrobial activity and EPS production. Among the isolates, Lactococcus lactis KX881768, Lactobacillus plantarum KX881772, Lactococcus lactis KX881782 and Lactobacillus plantarum KX881779 exhibited remarkable cholesterol removal abilities. Similarly, Lactobacillus plantarum KX881779, and Lactococcus lactis KX881782 showed very promising fermentation profiles. Enterococcus spp. showed good probiotic activities and remarkable antimicrobial properties. The health-promoting benefits of FFS fermented by Enterococcus species were greater than Lactobacillus ones.

Conclusions: Selected isolates from camel milk exhibited outstanding probiotic characteristics. Results of this study showed that, LABs isolated from traditional fish products in UAE had great potential to be used in food industry. Further studies are required to explore the health benefit of these isolates of fermented foods made by these isolates.

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