PROBIOTIC CHARACTERISTICS OF LAB ISOLATED FROM CAMEL MILK

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Introduction:
Camel milk is an excellent source where LAB can be isolated with high probiotic potential. Camel milk contains greater amount of natural antimicrobial compounds than bovine milk (Elagamy, Ruppanner, Ismail, Champagne, & Assaf, 1996). Food & Agriculture Organization (2008) has reported Somalia, Saudi Arabia and United Arab Emirates (UAE) as being the highest camel milk producing countries. To the best of our knowledge, Fguiri et al. (2016) is the only study that attempted to isolate and characterize LAB from camel milk. This study has significant drawbacks including lack of probiotic characterization including their acid and bile tolerance abilities, cholesterol removal ability, hemolytic pattern, and antimicrobial activity and use of old non-DNA based methods for identification of isolates. Therefore, the objectives of this study were to isolate LAB from raw camel milk and investigate their probiotic characteristics such as physiological properties, cell surface properties (hydrophobicity, autoaggregation, co-aggregation), acid and bile tolerance abilities, bile salt hydrolysis, cholesterol removing property, exopolysaccharide (EPS) production ability, hemolytic and antimicrobial activities, resistance toward lysozyme and six antibiotics, and fermentation profile (growth, pH, and proteolysis) and rDNA sequencing to identify those isolates.

Methods:
Physiological properties, cell surface properties (hydrophobicity, autoaggregation, co-aggregation), acid and bile tolerance, bile salt hydrolysis, cholesterol removing, exopolysaccharide (EPS) production, hemolytic and antimicrobial activities, resistance toward lysozyme and six antibiotics, and fermentation profile (growth, pH, and proteolysis) were examined. rDNA sequencing was carried out to identify the LAB isolates and to acquire Genbank accession numbers.

Results:
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, 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.

Discussion:
Selected isolates from camel milk exhibited outstanding probiotic characteristics. Results of this study showed that camel milk isolates, especially L. plantarum KX881779 (isolate 70) had great potential to be used in foods. Further studies are required to explore the health benefit of these isolates of fermented foods made by these isolates.

Keywords: Probiotics, Camel milk, Lactic Acid Bacteria, Lactobacillus, Cholesterol lowering

Citation: