Novel probiotic lactic acid bacteria isolated from indigenous fermented foods from West Sumatera, Indonesia

ABSTRACT

Background and Aim: Probiotics play an important role in maintaining a healthy gut and consequently promote good health. This study aimed to find novel probiotic lactic acid bacteria (LAB) from indigenous fermented foods of West Sumatera, Indonesia. Materials and Methods: This study utilized 10 LAB previously isolated from fermented buffalo milk (dadih), fermented fish (budu), and fermented cassava (tape) which have the ability to produce gamma-aminobutyric acid. The study commenced with the screening of LAB for certain properties, such as resistance to acid and bile salts, adhesion to mucosal surface, and antagonism against enteric pathogens (Escherichia coli, Salmonella Enteritidis, and Staphylococcus aureus). The promising isolates were identified through biochemical and gram staining methods. Results: All isolates in this study were potential novel probiotics. They survived at a pH level of 2.5 for 3 h (55.27-98.18%) and 6 h (50.98-84.91%). Survival in bile at a concentration of 0.3% was 39.90-58.61% and the survival rate was 28.38- 52.11% at a concentration of 0.5%. The inhibitory diameter ranged from 8.75 to 11.54 mm for E. coli, 7.02 to 13.42 mm for S. aureus, and 12.49 to 19.00 mm for S. Enteritidis. All the isolates (84.5-92%) exhibited the ability to adhere to mucosal surfaces. This study revealed that all the isolates were potential probiotics but N16 proved to be superior because it was viable at a pH level of 2 (84.91%) and it had a good survival rate in bile salts assay (55.07%). This isolate was identified as Lactobacillus spp., Gram-positive bacilli bacteria, and tested negative in both the catalase and oxidase tests. Conclusion: All the isolates in this study may be used as probiotics, with isolate N16 (Lactobacillus spp.) as the most promising novel probiotic for poultry applications based on its ability to inhibit pathogenic bacteria.