

Isolation and characterization of lactic acid bacteria from Sabah (North Borneo) stingless bees for probiotic and food applications

ABSTRACT

Stingless bees harbor lactic acid bacteria (LAB) which possesses multiple beneficial properties. However, there is no report on LAB in stingless bee from Sabah and their products. This study aimed to isolate LAB from several stingless bee species and their products as well as to perform characterization and safety assessments. A total of 104 strains were isolated and seven potential antimicrobial LAB isolates were identified from stingless bee and their products. Characterization, identification, and assessments were performed on seven (A2b, B3b, P1b, H4b, A6, B5, and B10) LAB that exert potential antimicrobial activity against *Listeria monocytogenes* ATCC 7644. The A6 isolate was closely related to the *Lactobacillus pentosus* species whereas isolates B5 and B10 were closely related to *Weissella paramesenteroides* species. Finally, isolates P1b, H4b, B3b, and A2b were closely related to the *Enterococcus* sp. These seven LAB isolates were able to survive in stimulated gastrointestinal tract conditions (acidic, salt, bile salt, and temperature). The carbon fermentation, proteolytic activities, acidification, milk coagulation, and wide antibiotic susceptibility testing of seven LAB isolates revealed their potential used as a probiotic and fermentation purposes. Therefore, more studies are warranted to investigate the potential of these LAB isolates towards applications in probiotic and fermentation.