

Isolation and safety characterisation of lactobacilli strains with antimicrobial properties as potential probiotics for human use

ABSTRACT

The present study focuses on the antimicrobial activity and safety aspect of lactobacilli strains isolated from the anogenital region. Sixty-two lactobacilli strains were isolated from 52 healthy, non-menstruating women from a local health clinic in Puchong, Selangor, Malaysia and confirmed by 16S rDNA sequencing. The samples were collected by sterile cotton swabs and directly streaked onto De Man, Rogosa, Sharpe agar prior to transportation to the lab on ice. A selective preliminary screening against several *Candida albicans* and *Candida glabrata* strains identified 5 promising lactobacilli strains for the subsequent assays; *L. delbreuckii* 45E, *L. fermentum* 28E, *L. mucosae* 28C, *L. reuteri* 29A and *L. reuteri* 29B. A follow-up antibacterial assay identified *L. delbreuckii* 45E, *L. reuteri* 29A and *L. reuteri* 29B as the lactobacilli strains with the highest inhibitory activity. Subsequent assays including haemolytic activity, susceptibility to antibiotics, quantification of D/L-lactic acid and H₂O₂ production as well as bile salt hydrolase (BSH activity) indicated that *L. reuteri* 29B was a promising probiotic candidate. An acute toxicity study in vivo involving the administration of 1×10^8 , 1×10^9 and 1×10^{10} cfu/mouse/day demonstrated that *L. reuteri* 29B did not exert any adverse effects towards the mice which were evident through the absence of pathological changes in the histological examination and blood test. There was also a lack of bacterial translocation as confirmed by Random Amplified Polymorphic DNA (RAPD). The present study highlights the possibility of utilising *L. reuteri* 29B as a probiotic. It also demonstrates the possibility of isolating potential probiotics from the anogenital region.

Keyword: Lactobacilli; *Lactobacillus reuteri*; Anogenital region; Probiotic