

Antimicrobial activity of goat milk yoghurt with addition of a probiotic Lactobacillus acidophilus IIA - 2B4 and roselle (*Hibiscus sabdariffa* L) extract

Abstract

Despite its advantages, goat milk has limitations in term of short shelf life and goaty odour. To overcome these limitations, in this research, goat milk was processed into yoghurt. To improve its quality, a probiotic bacterium isolated from Indonesian cattle, *Lactobacillus acidophilus* IIA-2B4, and roselle extract were added to the yoghurt. Total lactic acid bacteria (LAB) in yoghurt with addition of *L. acidophilus* IIA-2B4 with or without combination of roselle extract is significantly higher compared to the control. The high population of LAB in yoghurt with addition of *L. acidophilus* IIA-2B4 with or without roselle extract is proportional to the acidity of the product that promotes higher viscosity compared to the control. Proximate analysis revealed that additions of *L. acidophilus* IIA-2B4 and/or roselle extract significantly reduce fat content, while ash content is significantly increased by the treatments. Antibacterial activity assay demonstrated that goat milk yoghurt is able to inhibit both of Gram positive and negative bacteria with high selectivity towards Gram positive bacteria. Addition of *L. acidophilus* IIA- 2B4 with or without roselle extract increases the ability of yoghurt to inhibit Gram negative bacteria. This ability might be due to the presence of peptides exhibiting antimicrobial activity produced during fermentation by probiotic. SDS-Page revealed that addition of *L. acidophilus* IIA-2B4 with/without roselle extract produces <10 kDa peptides which display remarkable antimicrobial activity that might contribute to total antimicrobial properties of yoghurt. This indicated that increasing antimicrobial activity of yoghurt in the presence of *L. acidophilus* IIA-2B4 was also contributed by antimicrobial peptides produced during the fermentation.