

Techno-functional potential, development and evaluation of functional soy yogurt from *Lactobacillus* strains isolated from traditional fermented foods of West Garo Hills, Meghalaya, India

Sujit Das^{1*}, B.K. Mishra¹ and Subrota Hati²

¹Department of Rural Development and Agricultural Production, North-Eastern Hill University, Tura campus, Tura-794 001, Meghalaya, India

²Department of Dairy Microbiology, S.M.C. College of Dairy Science, Anand Agricultural University, Anand-388 110, Gujarat, India

*Corresponding author: sujitdas557@gmail.com

Abstract

Background and Objective: Lactic acid bacteria produces a group of enzymes namely α -galactosidases and β -glucosidases that catalyse hydrolysis of galactose containing oligosaccharide, which reduce digestibility of various food products and contribute to the dietary and sensory attributes of fermented foods by deglycosylation. This study deals with the techno-functional potential of *Lactobacillus* species isolated from naturally fermented foods of West Garo Hills region of Meghalaya, India for the development and evaluation of functional soy yogurt.

Methods: The *Lactobacillus* isolates were analysed to check the α -galactosidase and β -glucosidase activity using spectrophotometric enzyme assays and the best producers were used as starter cultures for the development of functional soy yogurt. The shelf life study of each soy yogurt variety was analysed in by storing them in different incubation temperatures (-4°C, 6°C and 33°C) and storage days (0, 3, 6 and 10 days) respectively and their physicochemical properties, microbial counts and sensory evaluation were determined.

Results: Out of forty nine fermented food-derived strains, *Lactobacillus rhamnosus* (K4) was selected as the most adequate producer of α -galactosidase (0.407 μ M/ml/min) and *Lactobacillus helveticus* (K14) produced maximum β -glucosidase (0.396 μ M/ml/min). Soy yogurt was produced from four formulations (control, plain, vanilla and rose white) with *Lactobacillus rhamnosus* (K4) and *Lactobacillus helveticus* (K14) as the starter cultures. The pH decreased and the titratable acidity (% lactic acid) increased during the storage period (0, 3, 6 and 10 days) of different soy yoghurt samples kept at different temperature conditions (-4°C, 6°C and 33°C). The microbiological evaluation (*Lactobacillus*, coliforms, yeast and moulds count) was done to examine the finished product on the survival of starter organisms as well as the presence of undesirable spoilage and pathogenic organisms. The organoleptic/sensory evaluation was carried out according to 9 points Hedonic scale and out of all the quality attributes of the soy-yoghurt samples; rose white flavoured yogurt sample was the most preferred by the sensory panellists.

Conclusion: In this study, *Lactobacillus rhamnosus* (K4) and *Lactobacillus helveticus* (K14) were potent producer of α -galactosidase and β -glucosidase enzymes and these culture combinations incorporated rose white flavoured soy yogurt showed acceptable sensory characteristics and further the probiotic potential and bio-functional properties of this product can be exploited.

Keywords: α -galactosidase, β -glucosidase, *Lactobacillus helveticus*, *Lactobacillus rhamnosus*, yoghurt
