ROLE OF POTENTIAL PROBIOTIC LACTOBACILLUS PLANTARUM L7 IN PREPARATION OF AN ETHNIC RICE-BASED FERMENTED BEVERAGE

[1]SIB SANKAR GIRI, [2]SUBRATA SAHA, [3]JIN WOO JUN, [4]SAEKIL YUN, [5]HYOUN JOONG KIM, [6]SANG GEUN KIM, [7]SANG WHA KIM, [8]SE JIN HAN, [9]KANG JEONG WOO, [10]SE CHANG PARK, [11]V. SUKUMARAN

[1,3,4,5,6,7,8,9,10]Laboratory of Aquatic Biomedicine, College of Veterinary Medicine and Research Institute for Veterinary Science, Seoul National University, Seoul-08826, South Korea
[2,11]Dept. of Zoology, Kundavai Nachiyar Government Arts College for Women (Autonomous), Thanjavur -613007, Tamil Nadu, India
E-mail: [1]giribiotek@gmail.com

Abstract - A probiotic bacterium, *Lactobacillus plantarum* L7, was isolated from the ethnic rice-based fermented beverage bhaati jaanr, and its fermentative characteristics were evaluated during a 6-day rice fermentation study. L7 decreased the pH, associated with an increase in total titratable acidity and organic acid production up to the 4th day of fermentation. The highest concentrations of lactic acid (4.95 mg/g), acetic acid (0.36 mg/g), and succinic acid (0.37 mg/g) were recorded on the 4th, 5th, and 3rd days of fermentation, respectively. α-Amylase (148.13 µg/min g^{-1}) and glucoamylase activity (89.47 µg/min g^{-1}) was highest on day 3 and day 2, respectively. The phytase activity, along with cleavage of free minerals, increased up to days 3–4. Fermented rice was found to contain much higher levels of sodium (0.92 ppm on day 4 of fermentation), calcium (1.34 ppm on day 3), magnesium (6.91 ppm on day 3), manganese (0.30 ppm on day 3), and ferrous iron (0.26 ppm on day 4) than unfermented rice. The concentration of various malto-oligosaccharides (glucose, maltotriose, maltotetrose, and fructose) and vitamin accumulation (ascorbic acid, folic acid, riboflavin, and pyridoxine) was found to be maximum levels on days 4–5. Furthermore, gas chromatography-mass spectrometry analysis indicated the presence of various volatile compounds. In total, 23 compounds were detected including various esters, alcohols, acids, and other compounds. The fermented material also exhibited 1,1-diphenyl-2-picrylhydrazyl and 2,2′-azino-bis(3-ethylbenzothiazoline-6-sulphonic acid) radical scavenging activity. Therefore, probiotic *L. plantarum* L7 has a significant role in the fermentation of this beverage and enhances its functional properties.