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α -Galactosidase activity and oligosaccharides reduction pattern of indigenous lactobacilli during fermentation of soy milk

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Abstract

Soy milk, a water extract of soybean, can provide a plentiful and inexpensive supply of proteins. Besides, other nutritive components such as lipids, vitamins, minerals, isoflavones, flavonoids, saponins, and bioactive peptides found in soy milk are known to have therapeutic values. Conversely, the presence of indigestible oligosaccharides and beany flavour have limited the wide consumption of soy milk. α -Galactosidase enzyme are known to hydrolyse these flatulence causing oligosaccharides. In this context, this study evaluated the α -galactosidases production potential and oligosaccharides reduction pattern of six *Lactobacillus* isolates during growth in soy milk. All the strains were efficiently grown in soy milk with viable count ranging from 5.7 to 10.4 Log₁₀ cfu/ml during 24 h of fermentation. All the strains were found proteolytic in nature represented varied degree of proteolysis at each fermentation step investigated. The highest proteolysis was observed by LR C34 (638.56±7.9 µg serine/ml) after 24 h of fermentation. Among studied *Lactobacillus* strains LR C8 displayed highest cumulative α -galactosidases activity between 6-18 h of incubation. Correspondingly, the highest utilization of sucrose and stachyose was also showed by LR C8. Overall, sucrose and raffinose were reduced maximum upto 24 h of fermentation in comparison to stachyose by studied lactobacilli. Interestingly, more than 90% reduction in stachyose given by LR C8 was significantly higher (P<0.001) than other strains, which recorded less than 37% utilization of said tetrasaccharide. Thus, these strains can be further explored for the preparation of soy based functional fermented foods and bioactive food supplements.

Keywords

Soy milk; Lactobacilli; α -Galactosidase; Oligosaccharides; Proteolytic

1. Introduction

Soybean (*Glycine max*), a leguminous crop native to East Asia is well-known for high protein contents and amino acid quality among plant products. Soy protein is often used to replace the animal proteins in an individual's diet, due to the fact that it is the only vegetable food which contain all the essential amino acids (Montgomery, 2003). Soybeans are consumed in

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