

Significance of Proteolytic *Lactobacilli* on ACE-inhibitory Activity and Release of Bioactive Peptides during Fermentation of Milk

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Objective

In this study, bacterial isolates i.e. *L. helveticus* NCDC 292, *L. bulgaricus* NCDC09, *L. acidophilus* NCDC015, *L. acidophilus* NCDC298, *L. casei* NCDC17 and 297, *L. helveticus* V3, *L. rhamnosus* NS4 and NS6 were evaluated for their growth behaviour, proteolytic activity, ACE-inhibitory activity, antibacterial and antifungal activity as well as release of peptides during fermentation of skim milk under specified growth conditions.

Methodology

All these *Lactobacilli* cultures were tested for their purity through gram staining and catalase testing. Then Growth curve study were carried out in different time intervals observing the pH, % lactic acidity and bacterial counts. *Lactobacilli* cultures were also evaluated for their proteolytic activity, ACE-inhibitory activity, antibacterial and antifungal activity. Selected cultures were subjected for the peptides production through HPLC analysis and also LC-MS is done to identify the selected amino acids in the purified peptides.

Result and Discussion

During the growth curve study, 015 and NS4 produced maximum % of lactic acid, viable counts as well as lowering of pH in skim milk medium after 12h of incubation at 40C. Generally, lactic acid bacteria have a strong proteolytic systems. However, O9 and NS4 showed maximum proteolytic activity after 48h of incubations during quantitative as well as qualitative analysis, pepX activity also showed highest in 015 and NS4 cultures. NS4 and 09 exhibited maximum ACE inhibitory activity compared to other isolates. NS4 exhibited highest antimicrobial activity against the test organisms (*E. coli* and *S. aureus*) compared to the other isolates. Water soluble extract derived from fermented milk released bioactive peptides during fermentation. Even, O9 and NS4 showed maximum peptides separation compared to other isolates during RP-HPLC analysis. These peptides produced by the isolates may be responsible for showing ACE inhibitory activity. These peptides are rich in His-Leu-Leu amino acids which are characterized through online protein database (Swiss port) during the LC-MS Analysis.

Conclusion

The above *Lactobacilli* cultures may be used further to prepare the functional fermented dairy foods having anti-hypertensive activity and antimicrobial activity.

ABSTRACT



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