

## Bienzymatic bioprocess for the conversion of 2-hydroxyisobutyronitrile into 2-hydroxyisobutyric acid

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**A**lcaligenes sp. MTCC 10674 was isolated as 2-hydroxyisobutyronitrile hydrolyzing bacterium from soil of orchid gardens of Himachal Pradesh. Acetone cyanohydrin hydrolyzing activity of this organism comprised of nitrile hydratase and amidase activities. The media components and culture parameter for production of acetone cyanohydrin hydrolyzing enzyme activity by this bacterial isolate were optimized using response surface methodology and inducer mediation approach was also used to enhance the acetone cyanohydrin hydrolyzing activity. Isobutyronitrile (40 mM) acted as a carbon source as well as inducer for growth of Alcaligenes sp. MTCC 10674 and expression of acetone cyanohydrin hydrolyzing activity. Optimization of culture condition using response surface methodology increased acetone cyanohydrin hydrolyzing activity by 1.3 fold, while inducer mediation approach increased the activity by 1.2 fold. The half life of this enzyme was 25 h at 15°C.  $V_{max}$  and  $K_m$  value for acetone cyanohydrin hydrolyzing enzyme was 0.71  $\mu\text{mole mg}^{-1}\text{min}^{-1}$  and 14.3 mM, when acetone cyanohydrin was used as substrate. Acetone cyanohydrin hydrolyzing enzyme encountered product inhibition and IC50 and  $K_i$  value were calculated to be 28 mM and 10.2 mM respectively, when product  $\alpha$ -hydroxyisobutyric acid was added in the reaction. Under optimized reaction condition 0.33 M acetone cyanohydrin was fully converted by 3 mgdcwml<sup>-1</sup> resting cell in 6 h 40 min at 40 ml fed batch scale with 25.6 mgml<sup>-1</sup>  $\alpha$ -hydroxyisobutyric acid accumulation. The characterization of acetone cyanohydrins hydrolyzing activity revealed that it comprises of bienzymatic nitrile hydrolyzing system i.e. nitrile hydratase and amidase for the production of  $\alpha$ -hydroxyisobutyric acid from acetone cyanohydrin and maximum 70% yield is being reported for the first time.

### Biography

Shashi Kant Bhatia has completed his M.Sc in Biotechnology in 2007 and pursuing Ph.D in Biotechnology from Dept. of Biotechnology, Himachal Pradesh University. He is working on nitrile hydrolyzing enzymes of Alcaligenes sp. for the synthesis of hydroxy acid from their corresponding hydroxynitriles.

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## Preparation of curd (dahi) in the presence of different prebiotic sources and study of their effect on physiochemical and microbiological properties of the curd

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**P**robiotics and Prebiotics have been demonstrated to positively modulate the intestinal microflora and could promote host health. Prebiotics, alone or in combination, along with probiotics can lead to an increase in the activity as well as number of the Lactobacillus sps in the curd, thus improving its quality. The aim of this study was to determine the effect of different easily available prebiotic sources on the physiochemical, sensory and microbiological properties of curd. Four different kinds of Prebiotic sources were used. The chemical properties were indicated in terms of pH and acidity and the microbiological properties were indicated by the growth of Lactobacillus spp. in the MRS media. All the prebiotic materials were shown to enhance the growth of Lactobacillus spp. The organoleptic and chemical property of the curd containing prebiotics was also compared to the normal curd.

### Biography

Shreya Mehrotra is pursuing her career in biotechnology; aim with respect to research is to make significant contribution towards improving quality and productivity, through qualitative research in Bioengineering, in food and food processing technology.

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