

7<sup>th</sup> Indo-Global Summit and Expo on  
**Food & Beverages**

October 08-10, 2015 New Delhi, India

**Biochemical characterization of gamma-glutamyl transpeptidase from *Bacillus atrophaeus*:  
Prospective debittering enzyme for food industry**

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Bitterness is a negative attribute associated with various food products. Thus, debittering, a process for removing the bitter component is an essential step required in food processing industries. These days various beverages called 'health supplements' are being sold. Amino acids like phenylalanine, valine, leucine and histidine are generally added to these nutritional supplements at high concentrations. These L- amino acids are bitter in taste however, they are essential for humans and need to be taken orally which is a crucial problem. It was found that  $\gamma$ -glutamylization of bitter amino acids led to debittering and added a sour taste, thus increasing the preference of the product. The  $\gamma$ -glutamylation of amino acids is catalyzed by GGTs. GGT uses glutamine as a  $\gamma$ -glutamyl donor. Till date GGT from *E. coli* only has been employed for the same. Thus, a new organism *Bacillus atrophaeus* which is considered as GRAS has been described here for its role in GGT production which can be efficiently used in debittering. This organism has not been much exploited yet and it is the first report of GGT enzyme from this organism. Enzyme production was done in specific medium and partial purification was attempted using ion exchange chromatography. Further, biochemical characterization of the partially purified enzyme was done. The enzyme was most active at pH 9.0 and the temperature optimum was 60° C. The pH and temperature stability, salt tolerance, acceptor variability, effect of different inhibitors and enzyme kinetics were also determined. For future overproduction, GGT enzyme was expressed in *E. coli* using pET51b vector. Biochemical characterization of the recombinant enzyme was carried out and compared to that of the wild type. Further the efficacy for removing bitterness of amino acids has been studied using this GGT enzyme as a debittering agent.

**Biography**

Meenu Saini is currently a PhD student working under the supervision of Professor Rani Gupta, Department of Microbiology; University of Delhi South Campus, India. Her work is on extracellular GGT enzyme produced by *Bacillus atrophaeus*. She has completed her Masters in Microbiology from University of Delhi, South Campus in 2012.

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