

L-theanine (L-Th), a non-protein amino acid present in tea is a valuable nutraceutical and food additive, amongst the top best seller for insomnia and generally regarded as safe (GRAS) ingredient by Food and Drug Administration (FDA). In vitro, in vivo as well as clinical studies have shown its positive effect in regulating various neurological disorders. L-Th enhances umami taste in tea and other possible efficiency, least waste formation and lowest environmental impact have been tried to meet its demand. More than 300 isolates from tea rhizosphere were screened for L-theanine synthesis using glutamine (20mmol L⁻¹) and ethylamine (50mmol L⁻¹) as donor and acceptor, respectively. Highest L-theanine producing strain was identified as *Bacillus altitudinis*

through physiological and biochemical properties with 16S rRNA sequence analysis and was further taken for optimization studies. The production of extracellular enzyme γ -Glutamyl transferase (GGT) was optimized using one-variable-at-a-time (OVAT) and 62 kDa was determined by gel filtration chromatography. The purified GGT has optimum pH and temperature 8.0 at 37 °C, stable up to pH 6-10 and temperature < 50 °C. The enzyme exhibited the highest affinity for Ca²⁺ ions. GGT produced from *Bacillus altitudinis* represents an attractive candidate for large scale L-Th production.