

## **ABSTRACT**

Accumulation of fibrin in the blood vessels usually results in thrombosis, leading to myocardial infarction and other cardiovascular diseases. For thrombolytic therapy, microbial fibrinolytic enzymes have now attracted much more attention than typical thrombolytic agents because of the expensive prices and the undesirable side effects of the latter. In our present study we have identified a highly potent fibrinolytic enzyme producing bacteria isolated from the fermented food sample, indigenous to North- East, India by undertaking morphological, biochemical and molecular approach, and done statistical optimization of the process parameters for the production of fibrinolytic enzyme from the bacteria. Based on the morphological and biochemical studies, the bacterium was found to fall under the genus *Bacillus*. From the 16S rDNA sequencing data, the bacterium was found to show maximum sequence similarity with the species *Bacillus thuringiensis*, while from the 16S-23S ISR region sequencing data, it showed maximum sequence homology with the *Bacillus* species, *Bacillus cereus*. From the initial screening data, the bacteria is found to show maximum fibrinolytic activity at pH 8.0, carbon source casein, nitrogen source ammonium sulphate and incubation time of 72 hrs. From the statistical analysis, using Plackett-Burman design, the factors carbon source (casein), nitrogen source (ammonium sulphate) and incubation time were found to be significant for fibrinolytic enzyme production. From the interaction study done with the help of RSM, the fibrinolytic enzyme production was found to be maximum at low level of casein and ammonium sulphate but at higher incubation time.