

## ABSTRACT

*Thermotoga* belongs to a group of hyperthermophiles that can grow at temperature as high as 80°C and can be exploited as a source of thermostable enzyme. This research work is directed towards cloning of 1.3 Kb  $\alpha$ -amylase gene of *Thermotoga petrophilla* RKU-I (Accession no. NC\_009486.1) in cloning vector pTZ57R/T through TA cloning technique, the cloned fragment was then sub-cloned in pET21a (+) expression system which was then transformed in *E.coli* BL21 Codon Plus. Expression of cloned gene was determined through SDS-PAGE that showed 50 KDa band of recombinant  $\alpha$ -amylase. DNS method was used for activity assay and optimum activity of  $\alpha$ -amylase was observed at temperature 85°C and pH 4.8 in Citrate buffer. Inclusion bodies were formed due to which enzyme activity was reduced, these inclusion bodies were solubilized by using 8 M urea and resulted in increased enzyme activity from 0.11  $\mu\text{mol/ml/min}$  to 2.9  $\mu\text{mol/ml/min}$ .