Abstract

The genus *Thermotoga* consists of a group thermophilic bacteria that can metabolize simple and complex polysaccharides for the production of biofuels. Because of having diverse enzymes in their genome, the gene encoding β-xylosidase having 2337 bp was cloned from *Thermotoga maritima* and overexpressed in mesophilic expression host *E. coli* BL21 CodonPlus (DE3)-RIPL. For molecular cloning of Tmxylo, pTZ57R/T was used initially and the gene was sub-cloned in an expression vector pET-28a(+). The gene in *E. coli* BL21 was expressed with 0.5 mM IPTG induction, the expression of recombinant protein was analyzed through SDS-Polyacrylamide Gel Electrophoresis and a prominent band of 86.8 kDa was observed. Moreover, TmXylo showed great affinity towards pNPX and remained stable at 85°C and pH 6.0. As β-xylosidase gene was cloned from hyperthermophilic bacterium has an ability to tolerate harsh condition and active at high temperature. This hyperthermophilic enzyme can be used as a substantial candidate in lignocellulose hydrolysis, food and feed industry in many industrial and biotechnology processes.