ABSTRACT

Hemicelluloses are second largest component of total plant biomass consisting of polysaccharides and xylan. One of the most important hemicellulase is xylanase which is used to produce short xylo-oligomers by hydrolysis of xylan and later this xylan id further breakdown by β-xylosidase. Consequently, β-xylosidase gene encoding for 549 amino acids from highly thermo-stable *Clostridium clariflavum* DSM 19732 cloned in pET-21a (+) vector and its expression was taken in *E. coli* BL21 (DE3) Codon Plus. The recombinant enzyme showed the molecular weight of 60 kDa, when purified by ammonium sulphate precipitation. The purified enzyme β-xylosidase showed an optimal activity at pH 6.0 and 70°C temperature. The enzyme showed enhanced activity when treated with metal ions like chlorides of sodium, potassium, magnesium, manganese, cobalt, cuprous, cobalt and zinc. The effect of inhibitors like EDTA, SDS and Tween 80, each with 1mM and 5mM concentration was observed for enzyme activity and it was observed that SDS (sodium dodecyle sulphate) was the most active inhibitor of enzyme activity and it inhibit more than 50% of enzyme activity after 1 hour of incubation. 10%, 20% and 30% organic solvents including iso-propanol ethanol, methanol and n-butanol drastically inhibited the enzymatic activity of β-xylosidase respectively. All these significant properties make β-xylosidase gene biotechnologically and industrially important candidate for the useful biological process.