Abstract

A highly thermostable xylanase Tnap_0691 gene encoding 1059 amino acids was cloned and expressed in *E.coli* BL21 (DE3) codon plus strain utilizing cloning plasmid pTZ57R/T and pET21a (+) expression vector. Cloned xylanase gene was expressed into recombinant β-xylanase constituted higher molecular weight of 150 kDa was determined by SDS-PAGE analysis. Maximum enzyme production was achieved at 37°C and at pH 8. At 0.5 mM induction of IPTG maximum recombinant β-xylanase enzyme activity was estimated by quantifying elevated amount of reducing sugars released acting on numerous substrates among them birchwood xylan showed higher enzymatic activity of about 2.9611 μ/ml/min. Purification of recombinant β-xylanase enzyme was achieved through anion exchange chromatography. Purified recombinant β xylanase enzyme showed maximum stability at temperature 80°C and pH 8.0 that can be utilize in various industrial applications like pulp paper industry for softening of papers, wood pulps bio bleaching, biofuels and bioethanol production.