SYNERGISTIC EFFECT OF ACETYL XYLAN ESTERASE ON XYLANASE REACTION ORIGINATED FROM *Ochrovirga pacifica*

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Acetyl xylan esterase plays an important role in complete enzymatic hydrolysis of lignocellulosic materials into fermentable sugars. It hydrolyzes ester linkages of acetic acid in xylan polysaccharide and supports to enhance the activity of xylanase. This study was conducted to recognize and overexpress the acetyl xylan esterase gene found from *Ochrovirga pacifica* strain S85 which was isolated from Chuuk state, Micronesia. The genome sequence was analyzed with genome sequencer-FLX and acetyl xylan esterase gene (Axe) was detected. The gene had an open reading frame of 864 bp encoding a polypeptide of 287 amino acids. Theoretical molecular mass and isoelectric point (pI) were 32 kDa and 5.9, respectively. The deduced amino acid sequence of the Axe showed 35.1% similarity with both endo-1,4-β-xylanase B from *Robiginitalea biformata* HTCC2501. The mature protein displayed the catalytic residues classically found in enzymes belonged to GH16 family. Axe was cloned into pET11a vector and recombinant protein was expressed in *E. coli* BL21 (DE3), purified by nickel affinity chromatography and its purity was visualized on SDS-PAGE. Commercial xylanase activity was tested after treatment of recombinant acetyl xylan esterase (rAXE) to birchwood xylan substrate. The xylanase activity of rAXE treated sample was about 2 times higher than xylanase only treated sample.

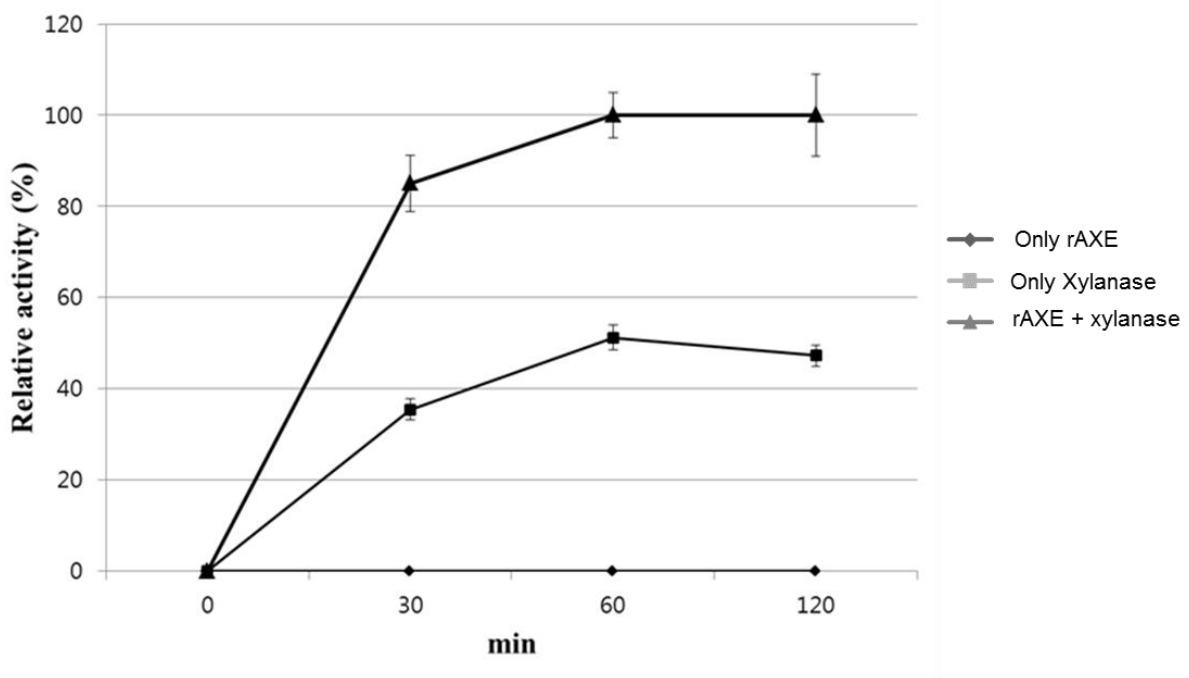

Figure 1. The synergistic effect of rAXE on xylanase activity. Substrate was used 1% birchwood xylan. The reactions were performed at 50°C for 0, 30, 60 and 120 min.