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Synergy Between an α-L-Arabinofuranosidase from *Aspergillus oryzae* and an Endo-Arabinanase from *Streptomyces coelicolor* for Degradation of Arabinan

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An α-L-arabinofuranosidase gene of *Aspergillus oryzae* was expressed in *Pichia pastoris*. The re-combinant enzyme released L-arabinose from arabinose-containing polysaccharides such as lupin pectic galactan, corn hull arabinoxylan, sugar beet arabinan, and potato pectic galactan. The enzyme displayed an optimum activity at 45°C and pH 4.0. The enzyme was slowly inactivated above pH 6.0 and below pH 3.0, and was stable at temperatures up to 40°C. On the other hand, a putative endo-arabinanase gene of *Streptomyces coelicolor* was cloned and expressed in *Escherichia coli*. The recombinant enzyme hydrolyzed linear arabinans and produced α-1,5-arabinooligosaccharides. The enzyme displayed an optimum activity at 45°C and pH 6.0. The enzyme was slowly inactivated above pH 10.0 and below pH 4.0, and it was stable at temperatures up to 35°C. Synergisms between the α-L-arabinofuranosidase and the endo-arabinanase for the degradation of arabinan and debranched arabinan were observed. The hydrolysis was most efficient when α-L-arabinofuranosidase and endo-arabinanase were in a ratio of 95 : 5.

Keywords: arabinan, α-L-arabinofuranosidase, glycoside hydrolase family 43, glycoside hydrolase family 54, endo-arabinanase

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