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Purification and properties of an extra...

Purification and properties of an extracellular beta-xylosidase from *Aspergillus japonicus* and sequence analysis of the encoding gene.

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Abstract

An extracellular protein exhibiting beta-xylosidase activity was purified from the culture filtrate of a filamentous fungus, Aspergillus japonicus strain MU-2, grown on oat spelt xylan. The purified enzyme was a monomeric glycoprotein with an apparent M(r) of 113.2 kDa as estimated by SDS-PAGE. beta-Xylosidase activity was optimal at pH 4.0 and 70 degrees C. The enzyme also showed beta-glucosidase and alpha-l-arabinofuranosidase activities. The genomic DNA and cDNA encoding this protein were cloned and sequenced. Southern blot analysis indicated that the beta-xylosidase gene (xylA) was present as a single copy in the genome. An open reading frame, consisting of 2412 bp, was not interrupted by introns, and it encoded a presumed signal peptide of 17 amino acids and a mature protein of 787 amino acids. The deduced amino acid sequence of the xylA gene product showed a high degree of identity (69%) to the primary structure of the Aspergillus niger beta-xylosidase XInD that belongs to the glycoside hydrolase family 3. Moreover, the xylA gene was functionally expressed in the yeast Pichia pastoris.

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