Title Alkaline active maltohexaose-forming α-amylase from Bacillus halodurans LBK 34 Author/s Suhaila Hashim, Osvaldo Delgado, Alejandra Martinez, Rajni Hatti-Kaul, Francis J Mulaa, Bo Mattiasson Department/s Biotechnology (LTH)

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Abstract English The gene encoding Amy 34, a maltohexaose-forming α-amylase from Bacillus halodurans LBK 34 isolated from Lake Bogoria, Kenya, was cloned and sequenced. The mature peptide consists of 958 amino acids with a theoretical molecular weight of 107.2 kDa and pI 4.41, respectively. The gene was expressed in Escherichia coli and the recombinant enzyme purified to homogeneity by a combination of metal chelate affinity and size exclusion chromatography. The pure enzyme exhibited optimum activity at 60 °C and pH 10.5–11.5. The enzyme retained over 60% activity after incubation at 55 °C for 4 h and was most stable at pH 9.0. Complete inhibition of enzyme activity was observed in presence of 5 mM Cu2+, Fe2+, Fe3+, Mn2+ and 5 mM EDTA. The enzyme displayed 80% of its original activity in presence of 1% (w/v) SDS and was stable in presence of up to 5 mM DTT. Maltohexaose (G6) was the main initial product of starch hydrolysis while other products formed were G4 > G2 > G5 > G3 and G1. The main end product of the enzyme's action on amylose, amylopectin and maltodextrin is maltotetraose. Amy 34 could not hydrolyse pullulan, α and β-cyclodextrin but could hydrolyse γ-cyclodextrin to produce glucose, maltose and maltotetraose. Maltotetraose was the smallest α-(1–4) linked maltooligosaccharide that could be hydrolysed by the enzyme. Subject Chemistry
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