

Gene cloning and characterization of cold-adaptive amylase from Antarctic *Arthrobacter* sp.

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The gene encoding an α -amylase from *Arthrobacter* sp. PAMC 27388, isolated from King George Island, Antarctica, was cloned into pET-28a(+) vector and heterologously expressed in *Escherichia coli* BL21 (DE3). Recombinant α -amylase protein was purified by Ni^{2+} -NTA affinity chromatography. The optimum condition for enzyme activity was at 30°C and pH 3.0. The α -amylase activity was stimulated by FeCl_2 , NaCl, KCl, β -mercaptoethanol and phenylmethylsulfonyl fluoride (PMSF), but inhibited by CoCl_2 , ammonium persulfate and urea. Thin layer chromatography (TLC) analysis showed that the cold-active α -amylase hydrolyzed starch, maltotetraose and maltotriose, and produced maltose as major end product.

Key words : *Arthrobacter*, psychrophilic, cold-active α -amylase, cloning, starch