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Biochemical Properties of α-Amylase from Peel of *Citrus sinensis* cv. Abosora

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Abstract α-Amylase activity was screened in the peel, as waste fruit, of 13 species and cultivars of Egyptian citrus. The species *Citrus sinensis* cv. Abosora had the highest activity. α-Amylase AI from Abosora peel was purified to homogeneity using anion and cation-exchange, and gel filtration chromatographies. Molecular weight of α-amylase AI was found to be 42 kDa. The hydrolysis properties of α-amylase AI toward different substrates indicated that corn starch is the best substrate. The α-amylase had the highest activity toward glycogen compared with amylopectin and dextrin. Potato starch had low affinity toward α-amylase AI but it did not hydrolyze β-cyclodextrin and dextran. Apparent Km for α-amylase AI was 5 mg (0.5%) starch/ml. α-Amylase AI showed optimum activity at pH 5.6 and 40 °C. The enzyme was thermally stable up to 40 °C and inactivated at 70 °C. The effect of mono and divalent metal ions were tested for the α-amylase AI. Ba^{2+} was found to have activating effect, where as Li^{+} had negligible effect on activity. The other metals caused inhibition effect. Activity of the α-amylase AI was increased one and half in the presence of 4 mM Ca^{2+} and was found to be partially inactivated at 10 mM Ca^{2+}. The reduction of starch viscosity indicated that the enzyme is endoamylase. The results suggested that, in addition to citrus peel is a rich source of pectins and flavanoids, α-amylase AI from orange peel could be involved in the development and ripening of citrus fruit and may be used for juice processing.

Keywords α-Amylase · *Citrus sinensis* cv. Abosora · Peel · Purification · Properties

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