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THE OPTIMUM CONDITIONS FOR FRUCTOOLIGOSACCHARIDE PRODUCTION BY USING CRUDE FRUCTOSYLTRANSFERASE OF PLANT ORIGIN

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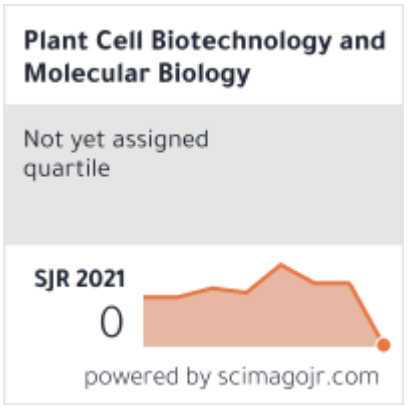
Abstract

Fructooligosaccharide (FOS) has an economic importance for its multiple uses in the food and pharmaceutical industries. FOS is produced naturally or industrially by enzymatic catalysis of a plant or microbial Fructosyltransferase (Ftase) enzyme. In the current study, the enzyme was extracted from plant sources, including Iraqi radish (*Raphanus sativus var. Longipinnatus*), Iraqi garlic (*Allium sativum*), Iraqi artichoke (*Helianthus tuberosus*), sweet potato (*Ipomoea batatas*) and Egyptian pineapple (*Ananas comosus*). The enzyme was extracted using potassium phosphate buffer at a pH range (6-8) in the presence of Cysteine, Triton x-100, and sodium acetate buffer at a pH range (4-7) in the presence of PMSF, EDTA and mercaptoethanol. Plant extracts showed the highest specific efficacy when using sodium acetate buffer at pH 6 for pineapple residues which was 200.732 units/mg protein. When studying the optimal conditions for FOS production using the crude enzymatic extract of the

pineapple residues, which included (pH, temperature, concentration of the substrate, the concentration of the enzymatic extract and time), it was found that the optimal conditions for FOS production depending on the enzymatic activity were (6.5, 40°C, 40% and 250 µL and 18 hours respectively) as the enzymatic activity reached (271.32, 265.385, 266.615, 273.564 and 271.897) units/ml, respectively. By determining the enzymatic reaction products with Thin Layer Chromatography (TLC) and comparing the reaction products with standard sugars, it was found that the extract contains glucose, sucrose, 1-kestose, Nystose and FOS at Rf of (0.83, 0.65, 0.566, 0.48 and 0.41). Respectively, the presence of fructose was not observed.

Keywords: Fructooligosaccharide; fructosyltransferase; optimal condition; thin layer chromatography



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