

ภาษาอังกฤษ

ส่วนที่ 1

Research Title Development of Inulin and Fructo- oligosaccharide (FOS) Production from Plant and Microorganisms for Economic Value Added

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ส่วนที่ 2 abstract

This research aimed to study on increasing yield of inulin from Jerusalem Artichoke (JA) (*Helianthus tuberosus* L.) by ultrasonic extraction, production of inulin and fructo- oligosaccharide (FOS) from plant and microorganisms, and stability and prebiotic properties of JA extracted inulin, synthesized FOS and commercial inulin. The results of JA inulin extraction by ultrasonic- assisted extraction (USE) showed that pretreatment factors including temperature, time and power level of an ultrasonic had significant effects ($p \leq 0.05$) on yield, total carbohydrate, reducing sugar content, total phenolic acid and inulin DP distribution. A comparative study of USE with hot water extraction showed that USE can improve the efficiency of inulin extraction and use short- time to extract. The analysis of JA derived callus extracts indicated the synthesis of inulin in callus as the major content which was similar to those found in natural grown tuber. The inulin synthesis and activity of fructosyltransferase in induced callus was consistency. Moreover, extracts from callus also showed prebiotic property. For production of fructosyltransferase by screening microorganism (SC1), it was found that 12.5 g/l sucrose, 25 g/l yeast extract and 5 g/l sodium nitrate were the best carbon and nitrogen sources, in respectively. The optimum pH and temperature of crude enzyme activity were 5 and 70°C, respectively. Maximum production of 15% kestose was obtained within 20 h of reaction when 20% sucrose solution and 1000 U/ml of enzyme were used. The synthesized FOS was rather unstable. Whereas, the stabilities of extracted inulin from JA were better than those of FOS toward all tested conditions.

Key words : Jerusalem artichoke, Fructo- oligosaccharide, Fructosyltransferase, Prebiotic