

Chemical Characterization and Prebiotic Effect of Water-Soluble Polysaccharides from Zizyphus lotus Leaves

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Abstract : In order to investigate the prebiotic potential of oligosaccharides prepared by chemical hydrolysis of water-soluble polysaccharides (WSP) from Zizyphus lotus leaves, the effect of oligosaccharides on bacterial growth was studied. The chemical composition of WSP was evaluated by colorimetric assays revealed the average values: $7.05 \pm 0.73\%$ proteins and $86.21 \pm 0.74\%$ carbohydrates, among them $64.81 \pm 0.42\%$ are neutral sugar and the rest $16.25 \pm 1.62\%$ are uronic acids. The characterization of monosaccharides was determined by high performance anion exchange chromatography with pulsed amperometric detection (HPAEC-PAD) was found to be composed of galactose (23.95%), glucose (21.30%), rhamnose (20.28%), arabinose (9.55%), and glucuronic acid (22.95%). The effects of oligosaccharides on the growth of lactic acid bacteria were compared with those of fructo-oligosaccharide (RP95). The oligosaccharides concentration was 1g/L of man rogosa sharpe broth. Bacterial growth was assessed during 2, 4.5, 6.5, 9, 12, 16 and 24 h by measuring the optical density of the cultures at 600 nm (OD600) and pH values. During fermentation, pH in broth cultures decreased from 6.7 to 5.87 ± 0.15 . The enumeration of lactic acid bacteria indicated that oligosaccharides led to a significant increase in bacteria ($P \leq 0.05$) compared to the control. The fermentative metabolism appeared to be faster on RP95 than on oligosaccharides from Zizyphus lotus leaves. Both RP95 and oligosaccharides showed clear prebiotic effects, but had differences in fermentation kinetics because of to the different degree of polymerization. This study shows the prebiotic effectiveness of oligosaccharides, and provides proof for the selection of leaves of Zizyphus lotus for use as functional food ingredients.

Keywords : Zizyphus lotus, polysaccharides, characterization, prebiotic effects

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