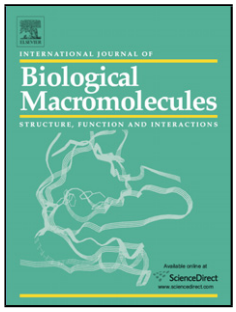

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The derivatization and antioxidant activities of yeast mannan

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Abstract

The alkaline mannan (M) was extracted from yeast cell walls, and the best extraction condition was: 100℃, 2h, 1% NaOH, solid-liquid ratio of 10:1. The purity of mannan was 96.15%. Its five derivatives were obtained by chemical modification methods, and they were: phosphorylated mannan (P-M), sulfated mannan (S-M), carboxymethylated mannan (CM-M), carboxymethylated-phosphorylated mannan (CMP-M), and carboxymethylated-sulfated mannan (CMS-M). The phosphate substitution degree of P-M and CMP-M was 0.2 and 0.1, respectively. The sulfate substitution degree of S-M and CMS-M was 0.67 and 0.65, respectively. The carboxymethyl substitution degree of CM-M, CMP-M and CMS-M were 1.11, 1.17 and 0.25, respectively. It indicated that the hydroxyl radical scavenging capacities of P-M and CMP-M were 15% higher than that of M. The anti-lipid peroxidation capacity of all derivatives increased than that of M, especially for CMP-M, its scavenging effect was 25% higher.

Keywords: Mannan from yeast cell walls; derivatives; antioxidant activities

1. Introduction

Yeast mannan is a kind of polysaccharide [1], which is found in the outer layer of yeast cell walls. It is usually connected with protein with the form of covalent bonding, so it is also known as mannan protein [2]. The main glycosidic bond chain form of mannan is α-1, 6 connection, and on the main chain there are rich branched chains, which are composed of mannose, mannobiose, manninotriose and mannotetrose, whose form of glycosidic bond is α-1,2 or 1,3 [3]. Mannan has the strongest immune function among the polysaccharides in yeast cell walls [4]. It can increase the humoral