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Free Radical Scavenging Activities of Chitosan Oligosaccharides Produced by Bioreactor

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The free radical scavenging activities of five kinds of chitosan oligosaccharides (COS) were investigated using 1,1-diphenyl-2-picrylhydrazyl (DPPH) and a spin-trapping electron resonance (ESR) method. Five kinds of COS with relatively very higher molecular weights (COS-Ⅰ: 30-10 kDa), higher molecular weights (COS-Ⅱ: 10-5 kDa), medium molecular weights (COS-Ⅲ: 5-3 kDa), lower molecular weights (COS Ⅳ: 3-1 kDa) and very lower molecular weights (COS Ⅴ: below 1 kDa) were prepared using ultrafiltration membrane in conjunction with an enzymatic bioreactor. The radical scavenging effects of COS on the DPPH radical were decreased in the order of COS-Ⅲ > COS-Ⅳ > COS-Ⅴ > COS-Ⅱ > COS-Ⅰ. In addition, COS-Ⅲ scavenged above 90 % hydroxyl radical at a dosage of 0.25 mg/ml with a reaction mixture of Fe^{2+} and H_2O_2 in the presence of spin trapping agent 5,5-dimethyl-pyrronine N-oxide (DMPO). Therefore, It seems that chitosan oligosaccharides have scavenging activities against DPPH and hydroxyl radical.

Key Words : *Scavenging activity, chitosan oligosaccharide, bioreactor, free radical*