Antimicrobial Activity of Different Molecular Weight Chitosan on Pseudomonas aeruginosa

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ABSTRACT

The antimicrobial effects of different molecular weight (MW) chitosan (water-soluble-grade W031, chitosan-grade SK10P8, food-grade N96, industry-grade A72 with MW 27.5, 94.1, 245.9, 350.7kDa, respectively) in 1% acetic acid solutions on the growth of Pseudomonas aeruginosa were investigated in this study. For the complete inhibition of P. aeruginosa growth, the minimum efficiency concentration (MEC) for all the chitosan solutions was 0.1% (w/v) or more. The close complete inhibition time (CCIT) for P. aeruginosa growth was at the first 48hr for all 0.1% chitosan solutions except for A72 chitosan (only at the first 32 hr), meanwhile the CCIT was at the first 72 hr for W031 one. The antimicrobial activity of chitosan increased as increasing its addition concentration in 1% acetic acid solution and then became unchangeable. In addition, the complete inhibition effect of chitosan on the growth of P. aeruginosa decreased with the chitosan MW increase when its addition concentration was less than 0.1%, while the complete inhibition of P. aeruginosa growth seemed not clearly vary according to the MW of chitosan as its addition concentration was higher than 0.1%. In this study, the low MW chitosan showed much more effective on the growth inhibition of P. aeruginosa than the high or medium MW one.

Keywords : chitosan, molecular weight, Pseudomonas aeruginosa, antimicrobial activity

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