THE EFFECTS OF SULFUR CONTENT ON ANTIMICROBIAL ACTIVITY AND WATER SOLUBILITY OF SULFONATED CHITOSAN AND SULFOBENZOYL CHI

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ABSTRACT

SHRIMP SHELL DERIVED CHITOSAN WAS CHEMICALLY MODIFIED TO OBTAIN SULFONATED CHITOSAN (SC) AND SULFOBENZOYL CHITOSAN (SBC) IN PYRIDINE AND METHANOL SOLVENT SYSTEM RESPECTIVELY. ANTIMICROBIAL ACTIVITY AND AQUEOUS SOLUBILITY OF THESE TWO CHITOSAN DERIVATIVES AS FUNCTIONS OF SULFUR CONTENT (RANGED FROM 1 TO 5%) WERE STUDIED. TEST MICROORGANISM INCLUDED ESCHERICHIA COLI（CCRC 10674）, SALMONELLA TYPHIMURIUM（CCRC 10746） AND STAPHYLOCOCCUS AUREUS（CCRC 12652）. GENERALLY SPEAKING, SOLUBILITY INCREASED WITH INCREASING SULFUR CONTENT. HOWEVER, INCREASED SULFUR CONTENT DID NOT RESULT IN HIGHER ANTIMICROBIAL ACTIVITY. IT WAS ALSO FOUND THAT THERE EXISTED OPTIMAL SULFUR CONTENT IN TERMS OF ANTIMICROBIAL ACTIVITY AND THE SENSITIVITIES TOWARD SULFUR CONTENT WERE STRAIN DEPENDENT. DEGREE OF DEACETYLATION ALSO AFFECTED THESE TWO PROPERTIES OF SC,SBC AND UNDERIVATISED CHITOSAN． SIMILAR CONCLUSION THAT THE INFLUENCE WAS STRAIN DEPENDENT WAS OBTAINED. RELATIVELY SPEAKING, SC AND SBC DEMONSTRATED SUPERIOR ANTIMICROBIAL ACTIVITY AND AQUEOUS SOLUBILITY THAN UNDERIVATISED CHITOSAN.

Keywords : DEGREE OF DEACETYLATION、SULFUR CONTENT、CHITOSAN、SULFONATED CHITOSAN 、SULFOBENZOYL CHITOSAN、MINIMUM INHIBITION CONCENTRATION

Table of Contents

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