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Antibacterial activity of chitin, chitosan and its oligomers prepared from shrimp shell waste

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ABSTRACT:

The antimicrobial activities of chito-oligosaccharides against four Gram-positive and seven Gram-negative bacteria were compared to chitosan and chitin with an emphasis on the effects of biopolymer molecular weight (Mv) and degree of deacetylation (DD). Chitin was isolated from shrimp (*Parapenaeus longirostris*) shell waste by sequential chemical treatments. Chitosan and its oligomers N-acetyl chito-oligosaccharides and chito-oligosaccharides were prepared by deacetylation and chemical hydrolysis, respectively. Chitin exhibited a bacteriostatic effect on Gram-negative bacteria, *Escherichia coli* ATCC 25922, *Vibrio cholerae*, *Shigella dysenteriae*, and *Bacteroides fragilis*. Chitosan exhibited a bacteriostatic effect on all bacteria tested, except *Salmonella typhimurium*. The oligomers exhibited a bactericidal effect on all bacteria tested