Outline

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Next Generation Nanochitosan

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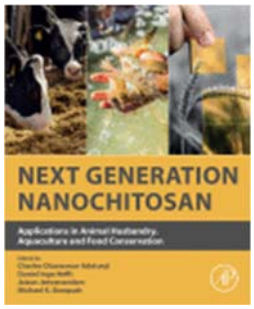

Chapter 21 - Utilization of nanochitosan in the sterilization of ponds and water treatment for aquaculture

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Abstract

Water pollution constitutes the leading cause of infant mortality, neonatal deformities, and shrinkage of man's average life expectancy. Pollutants come from point and nonpoint sources; and water pollution arises from the discharge of wastewater containing undesirable impurities used for domestic, agricultural, and industrial purposes. More so, high nutrient and wastewater runoffs from fish production systems contribute to the fouling and eutrophication of recipient water bodies. Hence, aquaculture which is inextricably linked to the natural environment is challenged by the dearth of appropriate water quantity and quality, militating against fish, and fishery production. Nanochitosans as polysaccharides produced by the alkalescent deacetylation of chitin, comprise a series of 2-deoxy-2 (acetylamino) glucose linked by ß-(1-4) glycosidic linkages. They are naturally formed from the deacetylation of shellfish shells and exoskeletons of aquatic arthropods and crustaceans. The unique attributes of chitin confer a wide range of biotechnological applications on the polymer, observed in flocculation as a wastewater treatment and purification route initiated by chitosan. This chapter highlights nanochitosan

properties of aquaculture relevance; and elucidates the purification potentials of nanochitosan, compared to inorganic coagulants and organic polymeric flocculants. Effects of chitosan on contaminants and microorganisms, as well as applications in fish pathogens detection, fish disease diagnosis, and control are discussed.

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Keywords

Aquaculture
Effluent
Pollutants
Steroid
Water quality
Water treatment

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