Potential Application of Chitosan Nanoparticles Derived from Marine Fish Scales as Preservatives for Fishery Product

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INTRODUCTION

The establishment of nanotechnology to convert raw biomass material to useful lower weight molecules is potentially applied to produce chitosan nanoparticles as a food additive and preservative. Fish scales as wastes sea food culinary in North Sulawesi Indonesia are considered the most suitable way to get chitosan in a high amount and low cost.

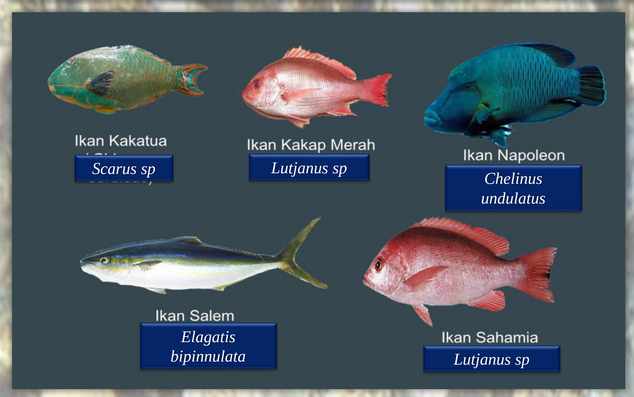


Figure-1: Five Marine fish in North Sulawesi

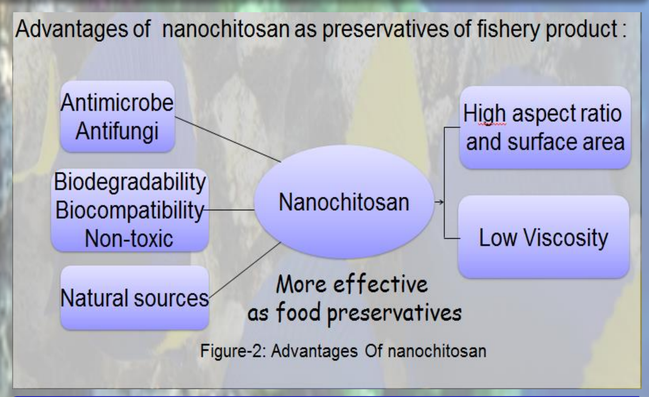
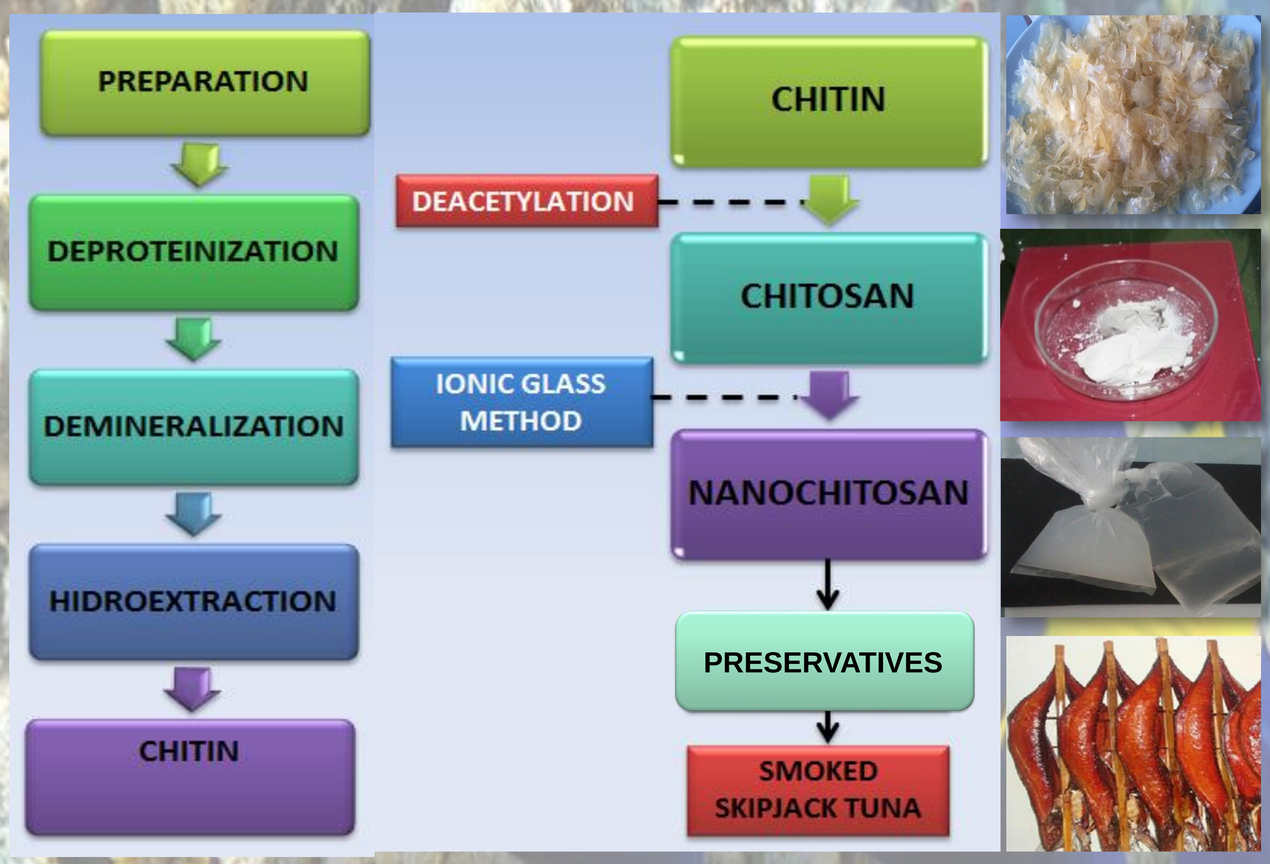


Figure-2: Advantages Of nanochitosan

METHOD



RESULTS

Tabel 1. Proximate analysis of 5 marine fish scale

No	The sample of 5 marine fish scale	Content (%)				
		Water	Ash	Lipid	Protein	Carbohydrate (*by differences*)
S1	Parrot Fish *(Scarus sp)*	8,83	36,28	3,68	32,30	18,90
S2	Red Snapper (*Lutjanus argentimaculatus*)	10,78	43,54	5,37	28,49	11,83
S3	Humphead wrasse (*Cheilinus undulatus*)	11,60	29,88	7,44	36,50	14,58
S4	Raibow runner (*Elagatis bipinnulata*)	10,54	44,88	4,13	25,09	15,36
S5	Mangrove red snapper (*Lutjanus argentimaculatus*)	13,20	43,80	5,12	25,70	12,18

Parrot fish scales (*Scarus sp*) have the highest carbohydrate value and potential to be applied

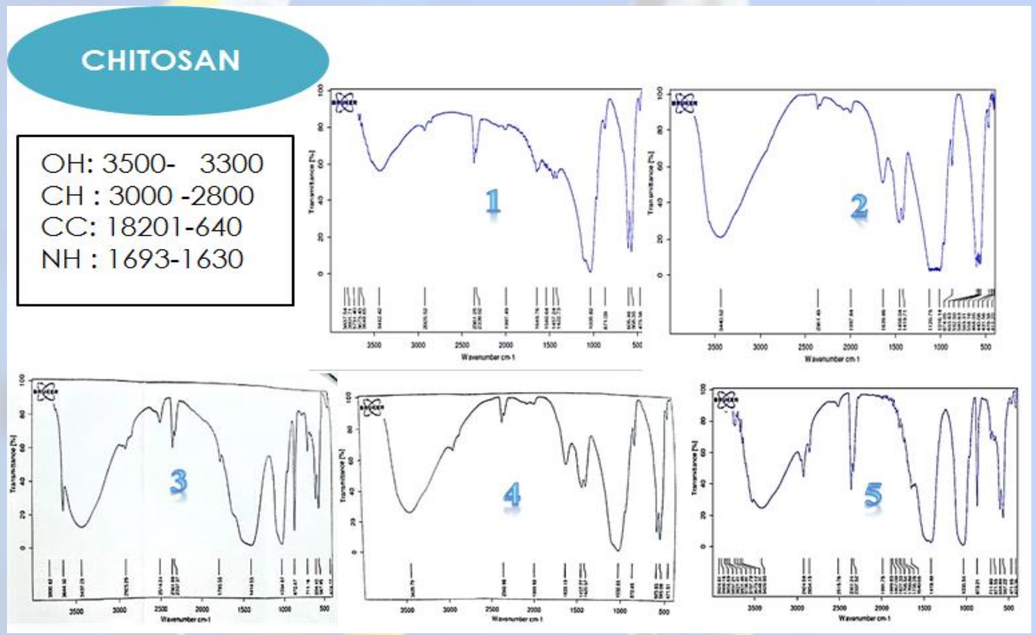


Figure- 3 : Chitosan functional group analysis of FTIR spectra results of five marine fish species (1) Red snapper (*Lutjanus argentimuculatus*) ; (2) Parrot fish (*Scarus* sp);(3) Humphead wrasse (*Chelinus undulatus*); (4) Rainbow runner (*Elagatis bipinnulata*); (5) Mangrove red snapper (*Lutjanus argentimuculatus*)

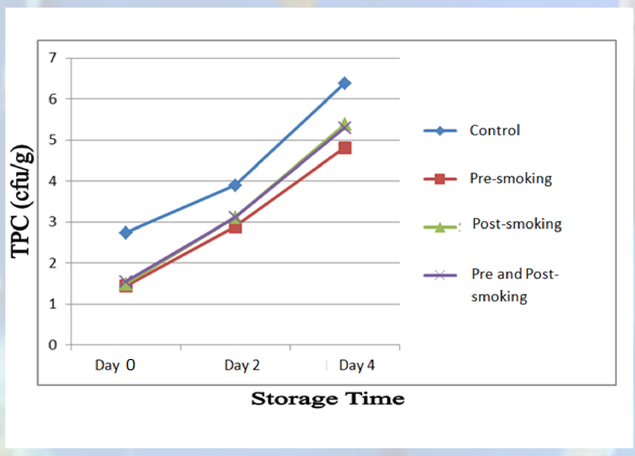


Figure 4 : Total Plate Count of Smoked Skipjack Tuna with nanochitosan derived from parrot fish scales

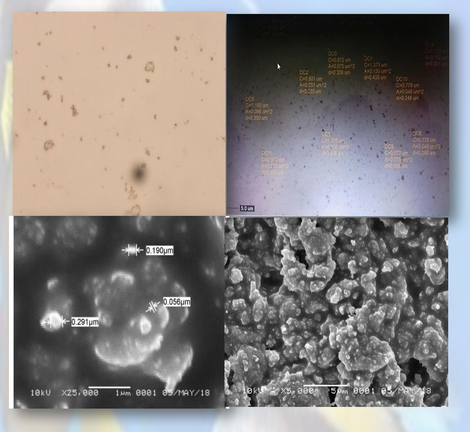


Figure 5 : Nanoparticles of chitosan were obtained as particulate dispersions or solid particles with a size in the range of 255 to 438 nm.

CONCLUSION

Chitin, isolated from 5 Marine fish scales, was successfully converted into chitosan by deacetylation reaction. In summary, modification chitosan to nanochitosan could apparently inhibit bactery in smoked Skipjack Tuna during the storage. Nanochitosan was proven to be a natural preservative and increasing the food security of fishery products.

ACKNOWLEDGMENT

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