Bacterial cellulose nanofibers as reinforce in edible fish myofibrillar protein nanocomposite films

Bahareh Shabanpour, Mohsen Kazemi, Seyed Mahdi Ojagh, Parastoo Pourashouri

PII: S0141-8130(17)34235-6
DOI: doi:10.1016/j.ijbiomac.2018.05.038
Reference: BIOMAC 9639

To appear in:

Received date: 29 October 2017
Revised date: 7 May 2018
Accepted date: 8 May 2018

Please cite this article as: Bahareh Shabanpour, Mohsen Kazemi, Seyed Mahdi Ojagh, Parastoo Pourashouri , Bacterial cellulose nanofibers as reinforce in edible fish myofibrillar protein nanocomposite films. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Biomac(2017), doi:10.1016/j.ijbiomac.2018.05.038

Bacterial cellulose nanofibers as reinforce in edible fish myofibrillar protein nanocomposite films

Bahareh Shabanpour[a]*
[a]Department of Fisheries, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran. b_shabanpour@yahoo.com, *corresponding author; Telephone number; +989111754393. FAX number: +981732424155
Postal Address: Department of Fisheries, Gorgan University of Agricultural Sciences and Natural Resources, Pardis. Gorgan, Iran

Mohsen Kazemi [a]
[a] Department of Fisheries, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran. kazemi_mohsen@yahoo.com

Seyed Mahdi Ojagh [a]
[a] Department of Fisheries, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran. Mahdi_ojagh@yahoo.com

Parastoo Pourashouri [a]
[a] Department of Fisheries, Gorgan University of Agricultural Sciences and Natural Resources, Gorgan, Iran. pourashouri.p@gmail.com

Abstarct

Bacterial cellulose nanofibers (BCNF) were employed in order to improve various properties of fish myofibrillar protein (FMP) films of Silver carp. Three different levels (2, 4 and 6%, w/w) of the nanoparticles were added to the protein polymer substrate. In this regard, it became clear that 6% BCNF-containing nanocomposites had the highest tensile strength, which was about 49% better than control samples. The nanoparticles had positive impact on the physical properties; BCNF-containing films showed a reduction in water vapor permeability, swelling and solubility indexes. The results of SEM displayed uniform distribution and continuous cross section of nanocomposite films. FTIR analysis of different films showed molecular interactions between nanoparticles and polymer substrate. XRD analysis represents the appearance of new peaks in polymer nanocomposites and the increase in crystallization of these films compared to the control film. Evaluation of thermal properties of these films suggests the improved thermal stability of the nanocomposites.

Keywords: Fish Myofibrillar protein, Bacterial cellulose nanofibers, Bio-nanocomposite, Fourier transform infrared, Mechanical properties, Microstructure