



SALMON SKIN GELATIN EXTRACTED FROM TRYPSIN-AIDED PROCESS FOR FILM WITH IMPROVED WATER RESISTANCE

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Abstract

Enzyme-aided process has successfully extracted fish skin gelatins with improved yields, but the high hygroscopicity of gelatin leads to the formation of films with poor water barrier properties. This research aims at investigating the recovery of gelatin from fish skins and to form films with improved water resistance. The trypsin-aided pre-treatment facilitated the extraction of the highest gelatin yield from Atlantic salmon (*Salmo salar*) fish skins, as compared to pretreatments with saline, and saline in combination with alkaline. The response surface methodology (RSM) was used to determine the optimum conditions of the trypsin-aided extraction process, and the films formed with the extracted gelatins were characterized. This research proposed the addition of corn zein and the replacement of glycerol with canola oil in improving the films' water resistance. The experiment demonstrated that the water solubility of the resulting films was significantly reduced, but the mechanical properties were weakened and confirmed through infrared and morphological studies. This research further seeks to reinforce the mechanical properties and water resistance with cross-linking induced by glutaraldehyde and the addition of zein. The addition of glutaraldehyde formed crosslinks in the gelatin-zein composite film successfully, as shown in infrared and morphological studies. The optimized glutaraldehyde-crosslinked gelatin-zein films exhibited lower water solubility and retained the mechanical strength with a slight reduction in elasticity. Overall, the results from this research provide a promising platform for the development of fish skin gelatin films with improved water resistance.



About the Candidate

Hui Yin Fan obtained a B.Sc. degree in Food Science and Bioprocess from the Universiti Malaysia Sabah and a M.Sc. degree in Food Science from the Universiti Kebangsaan Malaysia. Her Ph.D project was supervised by Professor Dr. Benjamin Simpson and Dr. Marie-Josée Dumont. She investigated the enzymatic extraction of filmogenic proteins from underutilized fish wastes, and explored the modifications for the formation of protein-based films with improved properties.