Poster Presentation

Development and characterization of fish gelatin-based films incorporated with rhubarb extracts.

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Abstract

Owing to the increasing environmental concerns on non-biodegradable plastics and related pollutions, there is a demand for sustainable packaging solutions. Gelatin-based edible films and coatings are being developed as ideal alternatives to plastic packaging (Abdelhedi., 2022). Fish skin and bones have significant potential to be used as high-quality gelatin. Gelatin obtained from cold-water fish species have relatively lower content of proline and hydroxyproline compared to gelatin from mammals and exhibits wide range of bloom values (Derkach et al.,2020). Moreover, fish gelatin has excellent film-forming ability, transparency, surface hydrophobicity, permeability and thermal property that promote them to be used as a promising material for developing packaging films (Khodaei et al., 2021). Some of the functional and mechanical properties of fish gelatin films can also be improved by addition of active ingredients (Ye et al., 2017; Nurdiani et al., 2022).

This study was focused on developing edible films from fish gelatin and its characterisation studies to see the potential for food packaging application. Gelatin obtained from fish scales of *Abramis brama* was used for the study. A commercial grade fish gelatin was used as control for comparison. Also, the tailoring effect of rhubarb pomace extract addition in the structural properties of fish gelatin-based film was also studied. Different concentrations of gelatin (5%) with glycerol (30%) and rhubarb extracts (5, 10 and 20 milligrams/ 100 ml gelatin solution) were prepared for developing the films and the characterisation studies were performed to find the physicochemical properties of the films. From the results it was found that all fish gelatin samples has similar L* values but a* and b* values were high with rhubarb extract (20 mg) included samples as well as control samples. The thickness of the developed films ranged from 0.12 mm to 0.14 mm. There is a significant difference in the opacity, transmittance, water vapor permeability and water solubility of the gelatin film with control films. There was no significant difference observed in the tensile strength of the films (13-14 MPa). Scanning electron microscopy, XRD and FT-IR spectra shows significance difference in the fish gelatin samples extracted from *Abramis brama* compared to commercial fish gelatin. The developed fish gelatin-based film showed high potential as bioactive packaging material.

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