

Author's Accepted Manuscript

Development of edible film from *Acanthophora spicifera*: Structural, rheological and functional properties

Abirami Ramu Ganesan, M. Shanmugam, Palaniappan Seedeve, Gaurav Rajauria



PII: S2212-4292(17)30740-X
DOI: <https://doi.org/10.1016/j.fbio.2017.12.009>
Reference: FBIO251

To appear in: *Food Bioscience*

Received date: 11 October 2017
Revised date: 21 December 2017
Accepted date: 21 December 2017

Cite this article as: Abirami Ramu Ganesan, M. Shanmugam, Palaniappan Seedeve and Gaurav Rajauria, Development of edible film from *Acanthophora spicifera*: Structural, rheological and functional properties, *Food Bioscience*, <https://doi.org/10.1016/j.fbio.2017.12.009>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting galley proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Development of edible film from *Acanthophora spicifera*: Structural, rheological and functional properties

Running title: *Seaweed hydrocolloid potential food application*

Abirami Ramu Ganesan^{a*}, Shanmugam. M^b, Palaniappan Seedeve^c, Gaurav Rajauria^d

^aSchool of Applied Sciences, College of Engineering, Science and Technology (CEST), Fiji National University, Fiji Islands-5529

^bResearch and Development Division (DSIR Lab), Aquagri Processing Limited, Sivaganga District, Tamil Nadu- India.

^cDepartment of Environmental Science, Periyar University, Salem- 636011, India

^d School of Agriculture and Food Science, University College Dublin, Lyons Research Farm, Celbridge, Naas, Co. Kildare, Ireland

***Corresponding author:** Email: abirami.rg@gmail.com; Telephone: +679 6667533 | Ext: 7086

Abstract

The sulfated polysaccharide was obtained from *Acanthophora spicifera* studied for potential function as an edible film in food application. The chemical characterization of sulfated polysaccharide showed 88.26 % total carbohydrate, 14.8% ash with no protein. Hydrogen, nitrogen and sulfur content were 38.08%, 7.04%, 8.04% and 0.28%, respectively. GC-MS analysis showed the presence of monosaccharide fractions like galactose (60.2%), 3,6-anhydrogalactosyl residue (21.8%) and xylose (5.8%). The molecular weight of sulfated polysaccharide was 47 kDa against dextran sulfate 50 kDa. The H-NMR spectra confirms β -D-galactose linkages at $\delta=4.69, 4.46, 4.27, 4.02$ ppm and singlet peak at 2.32 ppm corresponds with xylose group. Two different proportions of edible films were developed from sulfated polysaccharide using 20% and 30% glycerol. FT-IR spectra show the presence of ester sulfate and glucuronic acid group in the developed edible films. The two formulated films possess endothermic peaks at 114.78°C -129.94°C under differential scanning calorimetry. The thickness of the films was varied between 0.102-0.124mm with opaque characteristics. The water vapor permeability (WVP) of films was ranging from 8.82 to 11.92 $\times 10^{-8}$ gm⁻¹S⁻¹ Pa⁻¹ with higher tensile strength (32.78- 47.56TS) and low percent elongation at break (8.98- 10.24%E). The film samples showed stronger antibacterial activity against *L.monocytogenes*(46.77-72.98 mm²) than

Download English Version:

<https://daneshyari.com/en/article/6488851>

Download Persian Version:

<https://daneshyari.com/article/6488851>

[Daneshyari.com](https://daneshyari.com)