

Title Development of edible bioactive coating based on modified chitosan for increasing the shelf life of strawberries

Author K.D. Vu, R.G. Hollingsworth, E. Leroux, S. Salmieri and M. Lacroix

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Abstract

For increasing the shelf life of strawberries during storage, bioactive coatings were applied using modified polysaccharides of chitosan. First, antimicrobial tests were performed with selected essential oils to evaluate their antimicrobial capacities against moulds and total flora isolated from strawberries. Red thyme (RT) and oregano extract (OR) were found as strong bioactive agents against moulds and total flora isolated from strawberries, whereas limonene (LIM) and peppermint (PM) had lower antimicrobial properties. These essential oils were also used as bioactive compounds which were sprayed onto strawberries and evaluated for their potential to increase shelf life during storage at 4 °C. RT, PM and LIM were found to be more efficient preservative agents for strawberries during 14 days of storage. Finally, chitosan was functionalized by acylation with palmitoyl chloride to increase its hydrophobicity, to ensure a controlled release and improve its stability and adhesion to the fruit product. LIM and PM were incorporated into the modified chitosan to create bioactive edible coatings and these were tested for their ability to extend the shelf life of fresh strawberries during storage. Formulations based on modified chitosan containing LIM and Tween®80 were shown to perform better than other formulations.