Proceedings International
Platinum Open Access Journal (ISSN 2668-6384)

Proceedings, Abstract
Volume 3, Issue 1, 2021, 68
https://doi.org/10.33263/Proceedings31.068068

Shelf Life Extension of Apples through Nanoemulsions †

Faiza Fathima A. S. [1], Mohd Hashim Khan [1], Sneha Unnikrishnan [1], Karthikeyan Ramalingam [1,*]

[1] School of Life Sciences, B.S. Abdur Rahman Crescent Institute of Science and Technology, GST Road, Vandalur, Chennai -600 048, India
* Correspondence: karthikeyan.sls@crescent.education;
† Presented at Virtual symposium to observe World Antimicrobial Awareness week "Applications of biotechnology and microbiology with special emphasis on Antimicrobial resistance", 18-24 November 2020, Chennai, India
Received: 10.11.2020; Revised: 15.11.2020; Accepted: 17.11.2020; Published: 10.01.2021

Abstract: Food spoilage has been the major reason to use chemical preservatives for increasing the shelf life of fruits and vegetables. Increased consumption of these chemical preservatives like sodium benzoate causes the risk of inflammation, oxidative stress, obesity, allergies, anxiety, and pancreatitis and may also be carcinogenic to humans. This project was carried out to study and investigate nanoemulsion efficiency as an edible coating on Apples. The postharvest shelf life of these apples is only a few weeks, and they face a lot of challenges in transportation and export. The edible coatings of nanoemulsions (vegetable oil with water) have been promising and considered an alternative in increasing the quality and shelf life, thus preventing spoilage caused by microorganisms in apples. Synthesis of nanoemulsions (NEs) using oils (sunflower, castor, and olive) in water (O/W) was prepared through Micro fluidizer LM10. The mixture was repeatedly circulated to obtain uniform droplet sizes. The particle size distribution of the nanoemulsion was measured through DLS, and the Zeta potential was measured by (Malvern Zetasizer) instrument. The Minimum Fungal Concentration (MFC) was determined by a good diffusion method to determine the antifungal activities of NEs against *Rhizopus stolonifer* and *Aspergillus niger*. The identification of fungal strains was made using lactophenol cotton blue stain. Other characterizations such as PH, viscosity, stability, and dispersibility studies of the nanoemulsions were also performed. Thus, these Nanoemulsions are highly expected to increase food stability, thereby building a promising and safe preservation technology in the food industry. The futuristic aspect of this methodology is to gain an extended shelf life of apples, which would favor transportation and storage, resulting in reduced wastage of apples during postharvest.

Keywords: nano emulsions; apple; pathogens; spoilage; perishable; *Rhizopus stolonifer; Aspergillus niger*; safe preservation.

Funding

This research received no external funding.

Acknowledgments

This research has no acknowledgment.

Conflicts of Interest

The authors declare no conflict of interest.