

Application of cellulose nanobiocomposite coating in fruits

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Nanoreinforcement of the biodegradable polymers to prepare nanobiocomposites has already been proven to be an effective way to enhance some properties. So, these newly developed biodegradable polymer-based nanobiocomposites, that is, green nanocomposites, are the wave of the future and considered as the next generation materials. Reinforcement of biodegradable polymers with lignocellulosic fibers has been carried out with the aim of increasing its biodegradation rate and to enhance mechanical properties and gas barrier. However, to the best of our knowledge, there was no previous literature on the use of these reinforcing fibers like coatings in fruits. Our research group has prepared cellulose nanowhiskers or nanocrystals by treating native microfibrils or microfibrillated cellulose with high strong acids such as sulfuric acid; this hydrolytic treatment results in dramatic decreases in both the yield and fibril length down to 100-150 nm. After that we have used this to prepare dispersed solutions and using this to coat fruits. Throughout the storage period, the fruits ripening are accompanied by evaluation of pH, total soluble solids, total acidity, ratio Brix/acidity, total sugars and vitamin C, enzyme activity, color formation, pectin and texture analyses. The performances of the treatments control and fruits coatings with cellulose nanocrystals in different concentrations are studied by statistical analyses. The results show that there is potential in the use of cellulose nanocrystal in the nanobiocomposites from starch, gelatin, etc and use this nanobiocomposites obtained like coating since it can be efficient to maintenance quality of the fruits during storage period.

Biography

Kelen Cristina dos Reis has completed his Ph.D at University of Lavras, MG, Brazil with collaboration of Institute of Food Research, IFR, England, UK and postdoctoral studies from University of São Carlos, SP, Brazil. She has experience in Science and Technology of the Food, focusing on Packings of Alimentary Products and material for food industry, acting on the following subjects: biopolymer, starch, active packaging, biodegradable polymer, material science, nanobiocomposites.

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