XXV Congresso de Iniciação Científica da Unicamp
October 18 to 20 Campinas | Brazil
2017

Biofilms based on starch of arrowroot applied to preservation of plums

Juliana V. Silva*, Gabriela R. S. Santos, Bianca de O. Leme, Patrícia B. Nascimento, Gislaine F. Nogueira, Rafael A. de Oliveira.

Abstract

Plums are fruits rich in bioactive compounds, which have high antioxidant capacity. However, plums are highly perishable. Its shelf life is usually reduced by loss of firmness, nutritional and functional compounds. The use of edible coating is a recent alternative for improving post-harvest quality and prolonging the shelf life of plums.The objective of this research work was to evaluate the effect of application of edible coatings of arrowroot starch at concentrations of 0,2 and 4% (m/m), plus glycerol (15% in relation to starch mass), in post-harvest behavior of plums stored at 25 °C and 5 °C for 35 days.The 2% starch film adhered well to the surface of plums and was bright, while 4% starch film appeared opaque and flocculated. The plums stored at 25 °C withered and were contaminated by fungi after 7 days, and were preserved for only 14 days. For fruits stored at 5 °C, no visible changes in texture were observed.The water content, pH, acidity and soluble solids of fruits remained stable during the analyzed period.The anthocyanin content ranged from 5.64 ± 0.60 to 2.00 ± 0.16 mg/100 g of fresh sample. The films were efficient in relation to the control sample for weight loss in the first weeks of storage.It can be concluded that the use of coating allied to low temperature assists in the extension of plum shelf life.

Key words: *packing, coating, anthocyanins.*

Introduction

Plums present, in addition to a short harvest period, high perishability. One of the alternatives for the maintenance of fruit quality is the application of edible coating or biofilm on surface of the fruit.

Biofilm is a thin film, prepared from biological materials, which acts as a barrier to external elements and, as result, can protect the packaged product from physical and biological damage and prolong its life. Recently, there has been a great deal of interest in producing edible biofilms or biodegradable films, mainly by the interest in safe and high quality food and also by the concern about discards of nonrenewable materials.

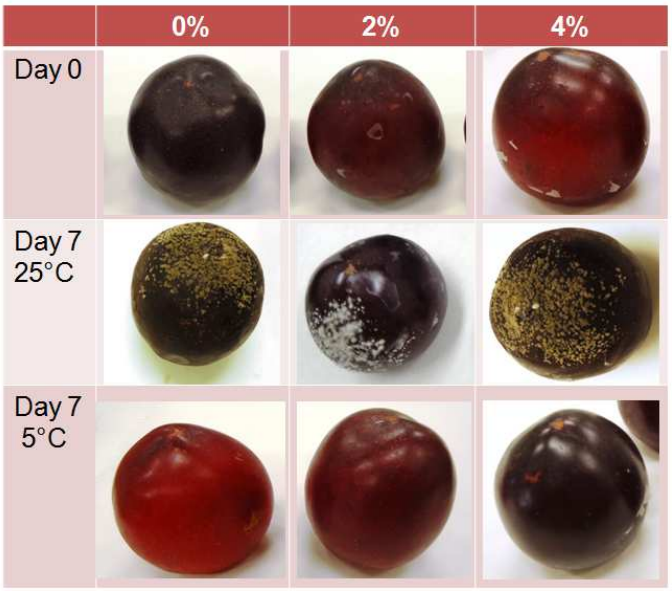
The objective of this research work was to evaluate the effect of application of edible coatings of arrowroot starch at concentrations of 0,2 and 4% (m/m), plus glycerol (15% m/m of solution solids) in post-harvest behavior of plums stored at 25 °C and 5 °C for 35 days. The fruits were analyzed for weight loss, appearance, water content, soluble solids, pH, titratable total acidity, respiration content of anthocyanins.

Results and Discussion

The starch films adhered well to plums peels. However, the 4% film appeared opaque and flocculated after storage at 25 °C. The plums coated with the 2% film were brighter. No visible changes in plum texture were observed when stored at 5 °C as opposed to those maintained at 25 °C, which withered and were been contaminated by fungi after 7 days, and were preserved for only 14 days. Plums stored at 5 °C present a shelf life of 35 days.

The films were efficient compared the control sample regarding on weight loss. The pH of fruits ranged from 3 to 4; acidity ranged from 1 to 2% and soluble solids ranged from 8 to 14 °Brix during storage period. The mean water content was 87.64%. There was a decrease in respiratory rate of samples over storage period, for both samples stored at 25 °C and 5 °C. The anthocyanin content of plums ranged from 5.64 ± 0.60 to 2.00 ± 0.16 mg/100g of fresh sample.

Figure 1. Plums coated with biofilm during storage.



Conclusions

Using edible coating allied to low temperature helps to improve post-harvest quality and prolong shelf life of plums.

Acknowledgement