

EFFECTS OF COATINGS BASED ON NANOPARTICLES AND ESSENTIAL OIL IN THE POST-HARVEST OF TOMATO

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Abstract

The technology for applying fruit coatings is a new alternative for conserving and increasing the useful life of vegetables. It is a technology considered simple and low cost, elaborated from biological materials acting as antimicrobial agents, antioxidants and as carriers of other functional substances, using essential oils and nanoparticles that can prolong the shelf life of fresh products such as tomatoes, without affect your sensory characteristics. The objective of the work was to evaluate the maintenance of post-harvest quality of tomatoes through the use of edible coatings made with essential oil of neem and nanoparticles of zinc oxide. For this, two formulations were prepared: T1 based on 1% Carboxymethylcellulose (w / v) added with 1.5% Neem essential oil (v / v); T2 Sodium alginate at 1% (w / v) with the addition of 0.015% (w / v) zinc oxide nanoparticle, and C as a control treatment without using a coating. The tomato fruits of the Italian type of the cultivar Ravena were harvested at the ripe stage and selected for health. After the treatments were applied, the fruits were stored at a temperature of 25 °C, at 80 — 85% RH and evaluated for phytopathological incidence (according to the visual aspect, evaluating the growth or not of fungal diseases), color and lycopene content every 3 days for 12 days. Regarding the incidence of phytopathogens that cause the deterioration of the fruit, the coating with organic neem oil (T2) showed greater efficiency in preventing the appearance of fungi in the tomato. The fruits submitted to this treatment (T2) did not present significant differences in the evaluated color parameters when compared to the fruits coated with nanoparticles (T1) and the control (C). Tomato color characteristics showed data on average by Fisher's test ($p \leq 0.05$), 40 for luminosity (L^*), 23 for red to green variation (a^*) and 4 for difference in luminosity (ΔL^*) in all treatments after 12 days. For lycopene content, an important nutritional parameter in fruits for exhibiting high antioxidant activity, coated fruits (T1 and T2) showed better results when compared to Control and similarity between treatments (results of T1 and T2 above 10,000 mg / 100 g fruit at the end of the 12 days). According to the parameters analyzed and associated with the fruit development stage, the coating with neem essential oil showed better results as a post-harvest alternative for extending the fruit's shelf life due to the prevention of pathogenic incidences, high lycopene content and not having significant differences in quality parameters such as color, within 12 days, at room temperature.

Keywords: Tomato, Edible Coating, Shelf life

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