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Effects of Plant Essential Oils on Storage Decay of Valencia Oranges

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Abstract

Oranges are among the most important fruits produced in Iran. Kerman province and Jiroft region represent the most important production zones in Iran. Blue and green decay of citrus fruits are the major reasons for reduction in fruit quality and market losses. Decaying due to blue and green molds in citrus fruits is caused by *Penicillium digitatum* and *P. italicum*. In commercial production chemical pesticides are used for controlling the disease. So, in this study the effects of three plant essential oils from rosemary, thyme and artemisia at three levels of 0, 500 and 1000 mg l⁻¹ on disease infection of the Valencia orange fruits were evaluated in three replicates.

The results showed that when fruits were inoculated with fungi suspension solution using scratching, fruits independent of the essential oil type and the concentration were almost completely decayed in less than one week. But, when fruits were inoculated just with soaking of fruits in fungi solution, treatments were significantly different regarding the number of healthy or decayed fruits, percent of weight loss, decaying intensity, fruit juice soluble solids, titrable acidity, and the content of vitamin C, but not for fruit juice pH ($p > 0.05$).

In this study the control group, fruits without any treatment, showed the highest percentage of healthy fruits with the highest fruit weight, total soluble solids, vitamin C and titrable acidity at the end of experiment. There was no significant difference between this control and the second level of artemisia and thyme application (500 mg l⁻¹) which in part showed a significant improvement compared to control 2 and both levels of rosemary.

Keywords: Artemisia, decaying, essential oil, rosemary, thyme, valencia orange