POSTHARVEST DISEASES OF POMEGRANATE FRUITS AND THEIR CONTROL

By

AHMED ATEF SABRY ABDEL-AZIZ

B.Sc. Agric. Sc. Plant Protection (Plant Pathology), Ain Shamus Univ. (2012)

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ABSTRACT

Ahmed Atef Sabry Abdel-Aziz: Post-harvest Diseases of Pomegranate Fruits and their Control. Unpublished M.Sc., Department of Plant Pathology, Faculty of Agriculture, Ain Shams University, 2018.

Pomegranate fruits are one of the most important and valuable fruits in Egypt. In recent years, there is a high increase of consumer demand of pomegranate due to its high nutritional and medical benefits. The most serious problem of pomegranate is fruit rot, either in the field or during post-harvest and marketing. This study focused on initiating various environmentally acceptable control measures to reduce pomegranate fruit rot.

Isolation of fungi from naturally infected fruits revealed incidence of fungal species were associated with these fruits. A total of 286 fungal isolates were collected from the samples, which collected from different eight surveyed locations. *Alternaria* spp. was the most frequently isolated fungi with pomegranate fruits, followed by *Penecillium* spp. and *Botrytis* sp. Different pomegranate orchards, at eight locations in four governorates, packing house and cold-storage, were inspected for surveyed occurrence and frequency of natural infected fruits by associated fungi. *Alternaria* spp. was the most frequently associated fungus with pomegranate fruits which naturally infected, followed by *Penecillium* spp. and *Botrytis* sp. In contrast, *Epicoccum* sp. was the least frequent fungus during season 2013. High incidence of pomegranate fruit rot was recorded at Manfalout, Tahta, Nubaria, Bani-mazar, Al-Balyana and Assiut. While, Wady El-Natroun and Malawy were the lowest locations, for fruit rot incidence. High occurrence and frequency of associated fungi isolated from pomegranate fruits were recorded at Manfalout, Tahta, Nubaria, Bani-mazar, Al-Balyana and Assiut, however, Wady El-Natroun and Malawy showed the lowest occurrence and frequency of natural infected fruits. Several fungal isolates, belonged to seven fungal species were isolated from natural infected pomegranate fruits which collected from different orchards, packing houses and cold-storage at different eight

locations of four governorates. These most common isolated fungi were identified as *Alternaria alternata, Penicillium digitatum and Botrytis cinerea.* Pathogenicity tests proved that all the most frequent isolated fungi were pathogenic to pomegranate fruit, with different degrees. *Alternaria alternata* was the most pathogenic fungus causing the highest percentage of disease severity, followed by *Penicillium digitatum* and *Botrytis cinerea* at 25±1°C. Whereas, *Botrytis cinerea* was the most pathogenic fungus causing the highest percentage of disease severity at 7±1°C. In contrast, *Penicillium digitatum* and *Alternaria alternata* were the least pathogenic fungi at 7±1°C. Immersing pomegranate fruits in hot water at 52°C for 1, 2 and 3 minutes gave the best results in suppressing the postharvest fruit rot. Inoculated pomegranate fruits held in carbon dioxide at 15% in air showed higher effect in reducing fruit rots caused by the pathogenic fungi followed by 10% carbon dioxide in air. Treatment of pomegranate fruits, artificially inoculated with the pathogenic fungi, by Potassium sorbate, Calcium acetate and Sodium bi-carbonate at a high concentration (10000 ppm) significantly reduced disease development, up 30 days storage period. Inoculated pomegranate fruits with the pathogenic fungi immersed in Acetic acid and Jasmonic acid at a high concentration (5000 ppm) gave a highest efficacy to reduce severity of infection.

Key words: Pomegranate, (*Punica granatum* L.,), fruit rot diseases, symptoms, survey, associated fungi, pathogenicity, hot water treatment, modified atmosphere, salt compounds, organic acids.

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