

POSTHARVEST DISEASES OF POMEGRANATE FRUITS AND THEIR CONTROL

By

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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 Unpublished M.Sc., Department of Plant Pathology, Faculty of Agriculture, Ain Shams University, 2018.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 $25\pm 1^{\circ}\text{C}$. Whereas, *Botrytis cinerea* was the most pathogenic fungus causing the highest percentage of disease severity at $7\pm 1^{\circ}\text{C}$. In contrast, *Penicillium digitatum* and *Alternaria alternata* were the least pathogenic fungi at $7\pm 1^{\circ}\text{C}$. 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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CONTENTS

	Page
LIST OF TABLES.....	III
LIST OF FIGURES.....	IV
I- INTRODUCTION.....	1
II- REVIEW OF LITERATURE.....	5
III- MATERIALS AND METHODS.....	27
IV- RESULTS.....	37
1. Occurrence and frequency under natural infection	37
2. Incidence of rot fungi within calyx and exocarp tissues in naturally diseased fruits.....	41
3. Symptomatology of pomegranate fruit rots.....	44
3.1. Alternaria fruit rot or heart rot.....	44
3.2. Penicillium rot or green mold.....	44
3.3. Grey mold or botrytis crown decay.....	45
4. Pathogenicity test of the isolated fungi.....	46
5. Control studies.....	48
5.1. Effect of hot water treatment on the development of pomegranate fruit rots.....	48
5.2. Effect of Modified atmosphere.....	52
5.2.1. Effect of modified atmosphere on fungal linear growth of postharvest pathogens.....	52
5.2.2. Effect of modified atmosphere on pomegranate fruit rots development.....	54
5.3. Effect of different salt compounds treatments on pomegranate fruit rots.....	57
5.3.1. Effect of different salt compounds amended in medium on linear growth (mm.) of the tested fungi	57

5.3.2. Effect of dipping application for different salt compounds on development of pomegranate fruit rots ...	61
5.4. Effect of different organic acids treatment on fruit rots...	66
5.4.1. Effect on linear growth (mm.) of the tested fungi	66
5.4.2. Effect of dipping application for different organic acids on development of pomegranate fruit rots.....	68
V. DISCUSSION.....	71
VI. SUMMARY.....	78
VII. REFERENCES.....	82
VIII. ARABIC SUMMARY.....	

LIST OF TABLES

Table No.		Page
1.	Number and frequency (%) of associated fungi isolated from naturally infected pomegranate fruits, during 2013 season.	38
2.	Occurrence and frequency (%) of associated fungi with naturally infected four governorates in Egypt, during 2013 season.	39
3.	Occurrence (%) of associated fungi with pomegranate fruits isolated from calyx and exocarp tissues collected from pomegranate orchards and cold storage at different four governorates in Egypt, during 2013 season.	42
4.	Pathogenicity test of the most frequent isolated fungi from naturally infected pomegranate fruits (Wonderful cultivar), disease severity % were determined after 5, 10, 14 and 21 days after inoculation at two different temperature degrees ($25\pm1^{\circ}\text{C}$ and $7\pm1^{\circ}\text{C}$) and 90% R.H.	47
5.	Efficiency of hot water treatment (HWT) to reduce rot development of pomegranate fruits, stored at $7\pm1^{\circ}\text{C}$ and 90% R.H. for 45 days after inoculation during first season.	49
6.	Efficacy of hot water treatment at 45, 50 and 52°C on rot development of pomegranate fruits stored at $7\pm1^{\circ}\text{C}$ and 90% R.H. for 45 days after inoculation during second season.	51
7.	Efficacy of different concentrations of modified atmosphere (Carbon dioxide in air) on reduction of radial growth of the tested fungi grown on PDA medium at $20-22^{\circ}\text{C}\pm1$ for 7 days <i>in vitro</i> .	53
8.	Efficacy of storage pomegranate fruits under different	55

Table No.		Page
	concentrations of modified atmosphere (Carbon dioxide in air) on reduction of disease development with tested fungi in cold storage at $7\pm 1^{\circ}\text{C}$ and 90% R.H. for 45 days after inoculation during first season.	
9.	Efficacy of storage pomegranate fruits under different conc. of modified atmosphere (CO_2 in air) on reduction of disease development with tested fungi in cold storage at $7\pm 1^{\circ}\text{C}$ and 90% R.H. for 45 days after inoculation during second season.	56
10.	Efficiency of different salt compounds at different four concentrations on reduction of radial growth of tested fungi grown on PDA medium at $22^{\circ}\text{C}\pm 1$ for 7 days <i>in vitro</i> .	59
11.	Efficacy of post-harvest dipping treatment of pomegranate fruits at maturity stage on Wonderful cv. with different salt compounds at different four concentrations on fruit rot development with tested fungi in cold storage at $7^{\circ}\text{C}\pm 1$ and 90% R.H. for 45 days after inoculation during first season.	62
12.	Efficacy of postharvest dipping treatment of pomegranate fruits at maturity stage on Wonderful cv. with different salt compounds at different four concentrations to reduce fruit rot development with tested fungi in cold storage at $7^{\circ}\text{C}\pm 1$ and 90% R.H. for 45 days after inoculation during second season.	64
13.	Efficacy of some organic acids at different four concentrations, to reduce radial growth of fruit rot fungi when, grown on PDA medium at $22^{\circ}\text{C}\pm 1$ for 7 days <i>in vitro</i> .	67
14.	Efficacy of post-harvest dipping treatment for pomegranate fruits at maturity stage, Wonderful cv.	68

Table No.		Page
	with three organic acids at different three concentrations on fruit rot development with tested fungi in cold storage at $7^{\circ}\text{C}\pm 1$ and 90% R.H. for 45 days after inoculation, during first season.	
15.	Efficacy of post-harvest dipping treatment for pomegranate fruits at maturity stage, Wonderful cv. with three organic acids at different three concentrations to reduce fruit rot development with tested fungi in cold storage at $7^{\circ}\text{C}\pm 1$ and 90% R.H. for 45 days after inoculation, during second season.	69