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ARABIC SUMMARY

SUMMARY

The present investigation was planned to study the postharvest pathogens which attacked tomato fruits affecting its quality and quantity and the different available physical, chemical and biological methods that can be used to control these rots which destroy the fruits during storage, exportation and marketing. The most important of the reached results are summarized in the following:

1. The fungal isolates obtained from tomato fruits which collected from wholesale and retail markets refrigerators in El-Sharkia and Giza governorates were identified as *Alternaria alternata*, *Botrytis cinerea*, *Rhizopus stolonifer*, *Aspergillus niger*, *Fusarium solani* and *Alternaria solani*.
2. The isolates were differed in their pathogenic capabilities to tomato fruits, *Alternaria alternata* which cause black mold and *Botrytis cinerea* which cause grey mould were found as the potent pathogens attacking tomato fruits, therefore they chosen for further studies.
3. Fruits of seven tomato varieties tested were found to be varied in their susceptibility to *A. alternata* and *B. cinerea*. Castle Rock, Peto 86 were the most tolerant than other tested varieties while Jacal, Flora dade and Ty_{84/84} were moderate. Supermarmand and strain B exhibit sever rots caused by *A. alternata* and *B. cinerea*.
4. The effect of maturity stage on the sensitivity of fruits against infection by the two pathogens demonstrated that fruits at mature green stage was less susceptible to the infection while those at red stage were the most susceptible by both pathogens.
5. Severity of infection and percentage of decay in inoculated and non inoculated tomato fruits increased, whereas total soluble solids, vitamin C content and acidity decreased as the storage period increased.

6. High amount of polygalacturonase (PG) and pectinmethylesterase (PME) enzymes were found in infected fruits by the two pathogens as compared by those in healthy ones. The optimum activity of PG was found at 37° and 25°C for *A. alternata* and *B. cinerea* and pH 6, while for PME at 30° and pH 4 in both healthy and inoculated tomato fruits.
7. Spore suspension of *B. cinerea* exposed to hot water treatment at 50°C for 7 min failed to germinate where, that for *A. alternata* failed to germinate when exposed to hot water at 55°C for 7 min. also exposing discs bearing growth of any of the two tested fungi to hot air treatment at 38°C, 40°C for 72 hrs suppressed growth.
8. Dipping tomato fruits in hot water at 55°C for 7 min or holding in hot air for 72 hours at 38°C prevent decay development in non-inoculated and artificially inoculated fruits by *A. alternata* and *B. cinerea*.
9. Scanning electron micrographs of infected fruits treated with hot water at 55°C for 3 min show that the spore formation inhibited and the mycelia appear lush within fruit tissues. Also, hot air treatment (38° for 72 hr.) highly distorted the mycelia of *A. alternata* which appeared irregularly branched with highly decreased in spore formation as compared by control while, growth of *B. cinerea* completely inhibited by the same treatment in the infected fruits.
10. The effect of some plant oils at different concentrations on linear growth of *A. alternata* and *B. cinerea*, revealed that, Cinnamon oil at 2000 and Carnation oil at 6000 ppm completely inhibited mycelial growth of the two pathogenic fungi, *in vitro*.
11. Cinnamon and carnation oils at 6 ml/l reduced tomato fruit rot caused by *A. alternata* and *B. cinerea* while Cinnamon oil at 2 ml/l completely reduced decay in naturally infected fruits.

12. Copper sulfate and salicylic acid completely inhibited the growth of *A. alternata* at 2000 and 600 ppm while salicylic acid at 4000 ppm and sodium carbonate, copper sulfate and potassium sorbate at 2000 ppm completely inhibited the growth of *B. cinerea*. The other chemical compounds used were lower effective against the two pathogens.
13. Salicylic acid and sodium acetate were more effective in controlling rot caused by *A. alternata*, but salicylic acid and potassium sorbate were more effective in controlling rots caused by *B. cinerea* at 6 g/l. Salicylic acid and sodium acetate at 6 g/l were completely reduced rots in naturally infected fruits.
14. Presence of acetic acid at 1.7 ml/l in the growth medium inhibited linear growth of *A. alternata* and *B. cinerea* while, exposure inocula to acetic acid vapor (8 μ /l) completely inhibited linear growth of both fungi.
15. Dipping tomato fruits in 4% acetic acid solution or fumigated them with 40 μ /l completely inhibited the development of postharvest rots of tomato fruits.
16. The acetic acid effect was confirmed by examination using scanning electron microscope showed that the mycelia of both pathogens appeared completely distorted and associated with the deformation of conidiophores as compared with control.
17. Dipping non-inoculated and inoculated tomato fruits with *A. alternata* and *B. cinerea*, in bioagents namely, Rhizo-N and Promot which commercially used at 2 g/l and also in spore suspension of *Trichoderma hamatum* isolate reduced to some extent, the severity of infection and percentage of decay. The effect of the three bioagents to overcome fruit decay increased as their concentrations infolded two or three times.