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The mango (*Mangifera indica* L.) is one of the most highly prized of tropical fruits. At the same time, the 'King of fruits' is so abundant that it has also been called 'the apple of the Orient'. Mango fruits have now in Eygpt the second great commercial importance. Many fungal diseases attack mango fruits at different growth of ripening stages and post harvesting like as Anthracnose caused by *Colletotrichum gloeosporiodes* (Penz.) Sacc., Black mould rot caused by *Aspergillus niger* v. Tieghem, *Botryodiplodia* rot caused by *Botryodiplodia theobromae* Pat., Stem-end rots caused by *Botryodiplodia theobromae* Pat. and other fungi and many other diseases. During shipment and storage many deterioration due to such diseases might be happened due to a previous infection specially within fresh mango fruits. Such spoilage reduce the quality and quantity and make a great losses. During roting process of mango fruits, many chemical, physical and physiological changes happined. For these reasons this study was done to explain some associated processes of diseased mango fruits during the different growth stages. The findings of study could be summarized as follows:

1- Many isolates of fungi were isolated from different parts of mango and die-backed branches of peach and pear. The highest frequency was of *B. theobromae* where it was isolated from all diseased parts followed by *Fusarium* spp., *Alternaria* spp., *Aspergillus niger*, *Epicoccum* spp., *Nigrospora* spp. and un-identified fungi were also isolated from infected fruits in low frequency.

2- Pathogenicity tests demonstrated that *B. theobromae* isolates and *F. moniliforme* had a slight effect to induce infection of un-wounded mango fruits at the rapid growth stage while the same *B. theobromae* isolates had a great ability to induce the rot symptoms on mango fruits cvs. Pyri and Taimour.

3- The symptoms appeared on inoculated mango fruits with *B. theobromae* after 4 days from inoculation, in the same time no rotting symptoms were obtained by *F. moniliforme* on un-wounded fruits. Whereas, the rotting symptoms were 100% through 3-5 days from the inoculation of wounded mango fruits cv. Pyri with *B. theobromae* isolates

4- This study showed also that the symptoms appeared only after 4 days from inoculation with *B. theobromae* on un-wounded mango fruits at ripening stage. Whereas the first symptoms appeared after 2 days from inoculation and extented quickly to reach 100% after 5 days from inoculation but the infection with *F. moniliforme* was only 25% till 5 days incubation.

5- The symptom appeared at mature ripening stage of cv. Pyri after 2 days from inoculation with *B. theobromae* on wounded and un-wounded fruits while the rot extended quickly on wounded fruits than on un-wounded fruits while it was only 15% on wounded and un-wounded inoculated fruits with *F. moniliforme*.

6- Pathogenicity tests of *B. theobromae* and *F. moniliforme* isolates on mango fruits cv. Taimour at pre-ripening stage showed that there were rotting symptoms about 20% on un-wounded fruits after 5 days incubation whereas the infection was extented rapidly to reach 100% through 3-5days

from inoculation with ***B. theobromae*** isolated from rotted mango fruit and showed also highly verulence than the others.

7- The rotting symptoms appeared also on wounded and un-wounded mango fruits cv. Taimour at mature ripening stage after 2 days from inoculation with all the pathogenic isolates. The rotting symptoms reached 45% on un-wounded fruits and 95% on wounded fruits after 5 days incubation period.

8- Symptoms appeared on the fruit inoculated with ***B. theobromae*** as a soft dark brown lesion, typically at the stem-end. Mature lesions may show minute black bodies (pycnidia) projecting through the skin. The same fungus able to produce a dark brown to black lesion with a clearly defined margins anywhere on the fruit. Decayed tissue is soft and moistend. It`s possible to see the mycellium of the fungus between grey and white colour on the decayed skin at the high relative humidity. The disease spreads quicklly inside the fruit causing maceration of tissues through 4 to 5 days.

9- Some factors affecting disease severity were studied. It was shown that the wounds played an important role on inducing the infection where the infection was affected with the type, long and deep of induced wounds. The highest infection was recorded at 10mm long deep wound while the lowest infection was on the superficial wounds by all pathogenic isolates at pre-ripening stage of cvs. Pyri and Taimour.

10-This study demonstrated also that the infection increased directly with the increase of inoculum density where the highest infection was recorded at $2.0x10^4$ spore/ml of the tested ***B. theobromae*** and ***F. moniliforme*** isolates.

The isolate *B. theobromae* was more verulent than *F. moniliforme* with the same inoculum on cvs. Pyri and Taimour.

11- This study showed that *B. theobromae* isolated from decayed mango fruits capable to induce rotting symptoms on pear fruits and peach fruits without wounds. On the other hand, *B. theobromae* isolated from die backed branches of pear and peach had also the ability to induce the infection of mango fruits while *F. moniliforme* isolated from mango fruits was the least pathogenic isolate to mango, pear and peach fruits.

12- Physiological studies on pathogenic isolates showed that PDA medium was the best nutirent media for growth and sporulation of *B. theobromae* isolates. Whereas, Czapek's medium was the optimum for growth of *F. moniliforme* while Brawn, Richard and Czapek's were the best for sporulation of the same isolate.

13- This study showed also that *B. theobromae* and *F. moniliforme* could be utilize many different carbon sources in their nutrition while succrose and glucose were the best carbon sources for growth and sporulation of *B. theobromae* whereas succrose, starch, dextrin and maltose were the most favourable carbon sources for growth and sporulation of *F. moniliforme* while, lactose was the least carbon source for growth and sporulation of all pathogenic isolates.

14- It was found also that *B. theobromae* isolates could be use many different nitrogen sources during growth and sporulation where sodium and potassium nitrate, asparagin and peptone were the most favourable nitrogen sources for growth and sporulation of *B. theobromae* isolates and *F.*

***moniliforme*** while ammonium nitrate and sodium nitrite were the least favourable ones.

15- This study showed that ***B. theobromae*** could grow at broad range of temperature between 4-35°C but the best temperature degrees for growth and sporulation were between 25-30°C. It was found also that 25°C was the best temperature for sporulation of ***B. theobromae*** and ***F. moniliforme*** and 30°C was the best temperature for growth of ***Fusarium*** isolate.

16- It was found also that ***B. theobromae*** isolates and ***F. moniliforme*** could grow between 14-100% R.H. while 100% R.H. was the best degree for sporulation and pycnidial formation of ***B. theobromae*** isolates and the best sporulation of ***Fusarium*** isolate was between 85-90% R.H.

17- It was found also that ***B. theobromae*** isolates could grow and sporulate between 3-8 pH value, while, pH 5 was the best degree for growth and sporulation of the same isolate. In the same time, the best growth of ***F. moniliforme*** isolate was between 3-4 pH and the best sporulation at pH 6.

18- The effect of light wave length showed no significant differences on growth and sporulation of ***B. theobromae*** and ***F. moniliforme*** isolates but red and blue light colours may be have some effects on sporulation of ***B. theobromae*** isolates and blue, red and yellow on growth and sporulation of ***Fusarium*** isolate.

19- The study of chemical changes as a result to infection process at different growth stages of mango fruits cvs. Pyri and Taimour showed that there were high reduction in acidity and total solouble solids (TSS) without any change in pH of infected wounded fruits at the first growth stages. This

reduction was very small in wounded fruits at the mature ripening stage while no evidence on reduction of these contents in un-wounded fat the different growth stages.

20- It was found also another high reduction in the total sugars, phenols and total amino acids in all of wounded inoculated mango fruits cvs. Pyri and Taimour with *B. theobromae* isolates as a result to infection at the different growth stages while no clear reduction of these compounds was remarked in un-wounded inoculated fruits. In the same time, increased the quantities of phenols in wounded and un-wounded mango fruits as a result to infection with *F. moniliforme* isolate at the different growth stages.

21- It was showed from the study of toxic activtiy of pathogenic *B. theobromae* and *F. moniliforme* isolates which induced mango fruit rots that there was no evident on the toxic effect in culture filterates of these isolates on inducing the infection when tested on the leaves of broad bean cv. Alfred and bean cv. Saxa.

22- From the enzymatical studies it was showed that *B. theobromae* and *F. moniliforme* isolates had the ability to secrete many degrading enzymes in the media containing different carbon sources. It was found also that the best secretion of cellulase enzyme was at pH 4.5 when used CMC, xylan and cellulose as a carbon sources.

23- It was found also that *B. theobromae* and *F. moniliforme* isolates could produce a high quantities of xylanase enzyme in the culture media containing xylan, CMC, cellulose, polygalacturonic acid and pectin at pH 4.5-6.8

24- It was showed also that ***B. theobromae*** isolates and ***F. moniliforme*** could produce a high quantities of PG (polygalacturonase) enzyme which is necessary to macerate the cells and induce soft rots of mango fruits at pH 4.5 . In the same time a low quantities of PG enzyme were produced at pH 6.8 .

25- The relationship between the incubation periods and secretion of degrading enzymes cellulase, xylanase and PG in culture medium containing xylan as a carbon source at pH 4.5 was studied and it is clear that enzymes quantities of cellulase and xylanase were directly increased with the increasing of incubation period to reach the highest secretion after 7 days incubation whereas the highest secretion of PG enzyme was after two days incubation period.

26- This study showed also that there were an increase in the production of cellulase, xylanase and PG enzymes in relation to incubation period where they gradualy increased to reach the highest secretion after 7 days from inoculation in culture medium containing CMC as a carbon source at pH 4.5.

27- The degrading enzymes cellulase, xylanase and PG were determined in infected mango fruits after 5 days from inoculation with ***B. theobromae*** and ***F. moniliforme*** isolates. It was found that ***B. theobromae*** isolated from mago was the highest isolate in production of degrading enzymes.

28- The relationship between the time and secretion of degrading enzymes in infected mango fruits, inoculated with ***B. theobromae*** (mango isolate) showed that the highest secretion of cellulase was after 2 days from

inoculation while secretion of xylanase and PG was after 4 days from inoculation of mango fruits with ***B. theobromae***.

29- It was found from the determination of total protein in culture filtrates of tested pathogenic isolates which were previously used to determine the enzymes activity that the production of total protein in culture filtrates of all ***B. theobromae*** and ***F. moniliforme*** isolates initialy inoculated at pH 6.8 more than the other at 4.5.

30- The relationship between incubation period and production of total protein in culture filtrates containing xylan or CMC as a carbon sources and inoculated with ***B. theobromae*** (mango isolate) showed that the quantity of protein increased directly with the increasing of incubation period to reach the highest production after 7 days.

31- It was found from the determination of total protein in healthy and diseased mango fruits which inoculated with ***B. theobromae*** and ***F. moniliforme*** and incubated for 5 days, that there was a high reduction in total protein in diseased fruits copmared with the healthy fruits.

32- Nine fungicides were tested *in vitro* according to the recomanded concentrations of these fungicides to know their effect and the possibility of use against mango fruit rots fungi. It was found that Bayleton and Cupravit were less effective fungicides against ***B. theobromae*** isolates while the others fungicides i.e. Dithane M-45, Ridomil-MZ, Benlate, Rovral, Vitavax, Topsin-70 and Trimeltox-forte were effective to control mango fruit rots fungi *in vitro*.

33- Mango trees in orchard were treated with Dithane M-45 and Ridomil MZ which were tested previously ***in vitro*** and selected according to their efficacy against mango fruit rots fungi, where they sprayed on mango trees in the field directly after fruit set for 3 times. Treated mango fruits were harvested after one month from the late spray and stored in the lab. at room temperature (23-25°C). It was remarked that the rotting symptoms were reduced on sprayed fruits for three times more than the sprayed fruits for two or one spray. It was clear also that Dithane M-45 was more effective than Ridomil MZ in controlling mango fruit rots. Thus we could be say that the use of this method may be effective to reduce the losses of mango fruit rots during shipment and storage.