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## First Record of Fungal Stem Canker Disease on Citrus in Egypt

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**Abstract** In Egypt, during Feb. and March, 2012 canker disease of citrus plants 2 years old was first observed in, Mansouria, Giza, Egypt on a new mandarin cultivar ( Morket on rootstock Swingle) exported from South Africa Republic. Canker syndromes beginning as small sunken circular lesion of main stem then developed to necrotic lesions then trun to elongation shape increase reach to reach 2 x1 cm. Phloem and cambium were brownish colour and necrotized and abnormal raise part in the center of necrotic lesion, this part not easy remove. Samples of diseased stems tissue were collected for isolation causal organisms .The frequency of fungal associated on diseased tissues were *Phomopsis* sp. 60 % and 40 % of *Fusicoccum* sp.with no other fungi were develop . Pathogenicity test of pure cultures of two fungal isolates on mandarin CV. Morket indicated that *Fusicoccum* isolate clearly induce typical canker symptoms plants .Meanwhile *Phomopsis* isolate alone or in combination with *Fusicoccum* isolate were failure for induce any syndromes of plants tested. In addition, pathogenic isolate of *Fusicoccum* were failure for induce any syndromes of other citrus plants, mandarin Cv. Balady, orange and greepfruit. Pathogenic isolate was successfully re-isolated from the canker lesions then compeletly identification as *Fusicoccum* sp. According to the available literature, this is the first record fungal canker of citrus in Egypt.

**Keywords:** citrus, canker, *Phomopsis* sp. and *Fusicoccum* sp

### Introduction

Citrus is a major export commodity of Egypt, with production estimated to be 2.5 million metric tonnes per year. Sooty canker of citrus recorded in Arizona, USA caused by a fungus *Hendersonula toruloidea* (now classified as *Nattrassia mangiferae* or a species of *Fusicoccum*). The fungus invades wounded sites in the bark of limbs and trunks and causes sunken lesions that break open with a black mass of spores under the bark. Individual limbs that are infected may die and should be pruned away. Once the trunk becomes infected, the tree usually dies. In Hungary (Vajna 2004) mentioned that canker disease of black locust (*Robinia pseudoacacia*) was occurrence ranged between 8-40%.

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As a consequence of bark necrosis and cankers exposing the xylem of the trunks of 2 to 3-year old trees, trunks broke and eventually many trees died. The cause of cankers was identified as *Phomopsis oncostoma* (Thuem.) Traverso, teleomorph: *Diaporthe oncostoma* Fuckel. Its alpha conidia measured 10.3 x 2.6 µm (7.5 - 12.5 x 2.5 -3.0 µm), beta conidia, however were not found.

The fungus was pathogenic to 2-year-old stems of black locust following inoculation of stems with mycelial agar plugs from a monoconidial culture. After 12 days, sunken and greyish necrotic lesions developed on the infected stems. This study aimed to isolation, identification of causal pathogen causing canker on citrus in Egypt.

## **Materials and methods**

### ***Isolation and identification of causal pathogens***

Samples of citrus mandarin Cv. (Morket on rootstock Swingle) showing canker of stems were collected during 2011 from citrus orchard at El Mansouria, Giza, Governorate, Egypt. Tissue of diseased stems by canker were cut into small parts 1cm then surface sterilized using 1% sodium hypochlorite for 5 min. then washing with sterilized distilled water several times then cultured on potato dextrose agar medium (PDA) and incubated as mentioned above. The plates were incubated at 25 °C for 7 days. Colony margins were then transferred onto (PDA) as part of the culture purification process by single spore culture technique. Fungal isolates were identification according to (Barnett and Hunter, 1998).

### ***Pathogenicity test***

Wounded twigs of citrus Cvs. (Morket on rootstock Swingle) , mandarin Balady, orange, greepfruit were inoculated with fungal isolates using mycelia agar plugs of each fungal growth (4- mm) 10 days old on (PDA) medium. Five replicates were used for each treatment. After inoculation twiges were covered in high relative humidity by plastic backage for 10 days. Diseased brunches were observed and pathogenic isolate was reisolated from diseased plants.

## Results

### *Isolation ,identification and pathological potential of fungal isolates*

Data obtained indicated that, *Fusicoccum* sp. and *Phomopsis* sp. were the common fungi associated with tissue affected by canker disease on mandarin Cv (Morket on rootstock Swingle). Frequencies of fungal association were 40% and 60% respectively with no other fungi was observed. Data obtain indicated that isolate of *Fusicoccum* sp. was able alone to induce clear canker and death symptom on foliages of mandarin Cv. Morket. Meanwhile *Phomopsis* sp. alone or in combination with *Fusicoccum* sp. was failure to induce any diseased syndrome. In addation, pathogenic isolate of *Fusicoccum* sp. were failure for induce any syndromes of other citrus plants, mandarin Cv. Balady, orange and greeppfruit.





**Fig. 1.** Different symptoms of canker of citrus (mandarin Cv. Morket) 1= initial infection showing circular sunken lesion, turn to elongation shape as shown (2). Brownish and necrotic abnormal raised part in the center of necrotic lesion as shown (2, 3 and 4). Different degrees of canker syndromes (4).

## Discussions

Our observation clearly indicates that fungal isolate of *Fusicoccum* sp. causing canker disease of mandarin Cv. (Morket) recently exported from South Africa Republic. As far as the writers are aware, this is the first record in Egypt.

Sooty canker caused by *Fusicoccum* sp. of citrus was recorded in Arizona, USA (Anonymous, 2011). In Hungary (Vajna, 2004) reported that canker of black locust (*Robinia pseudoacacia*) caused by *Phomopsis* sp. ranged between 8-40%. As a consequence of bark necrosis and cankers exposing the xylem of the trunks of 2 to 3-year old trees, trunks broke and eventually many trees died.

According to the available literatures, this is the first record of fungal canker disease on citrus in Egypt.

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