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 frequencey 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 completly 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 25ºC 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, greefruit 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 greepfruit.
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 raise part in the center of necrotic lesion as shown (2, 3 and 4). Different degrees of canker syndromes (4).

Discussions

Our observation clearly indicate 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 first record in Egypt.

Sooty canker caused by *Fusicoccum* sp. of citrus was recorded in Arizona, USA (Anonymoues, 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.

References


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