

Report of Black Scorch Disease on Date Palm Trees in the State of Kuwait

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Abstract

Date palm (*Phoenix dactylifera* L.) is one of the most important fruit crops grown in large area in the state of Kuwait. This study was carried out to evaluate the incidence of various fungal diseases on date palm in major growing areas in state of Kuwait. Fifty (50) infected samples of date palm were collected from 15 farms (10 farms in Al-Wafra and 5 farms in Al-Abdally). Microscopic examination and morphological characterization revealed that *Chalara paradoxa* (synonym = *Thielaviopsis paradoxa*) and *Chalara radicola* are the causal fungal pathogen of black scorch disease. Information from this study will help scientists to design effective strategies in controlling date palm diseases.

Keywords: Date palm; fungal diseases; *Chalara paradoxa*; *Chalara radicola*; black scorch disease.

1. Introduction

Date palm (*Phoenix dactylifera* L.) is one of the most important fruit crops grown in large area in the state of Kuwait. They are among a few plants that could survive the harsh arid environment and thus is highly regarded for the nutritional value that the palm tree fruit provides [1].

Date palm infected with several fungi resulting in decline of the growth and production. Several fungal diseases of date palm trees have been reported from many date producing countries. The most common disease of date palm was Bayoud disease caused by *Fusarium oxysporum* f.sp. *albedinis*.

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This disease is the most serious date palm disease especially in Morocco and Algeria [2]. The Inflorescence rot (Khamedj), Black scorch, rooting of aerial offshoots and Leaf spots are considered of date palm serious diseases [3].

Black scorch is a fungal disease also referred to as medjoon or fools disease. It is a disease that affects all parts of date palm. It has been found on palm in countries in North Africa, U.S.A., Iraq, Saudi Arabia, and currently in Kuwait. In Kuwait this disease is potentially damaging to palms under water and salinity stress in landscapes and plantations. The disease was found in nurseries, plantations and landscape settings.

This study was carried out to evaluate the incidence of various fungal diseases on date palm in major growing areas in state of Kuwait.

2. Materials and methods

2.1 Area of study

Fifty (50) infected samples of date palm were collected from 15 farms (10 farms in Al-Wafra and 5 farms in Al-Abdally). Samples of affected tissues of symptomatic trees represents different parts of infected tree collected from various farms were kept in plastic bags and transferred to laboratory for investigation. Total of 1160 date palm trees were examined

2.2 Identification of fungal isolates

The identification of fungal isolates was performed on Potato Dextrose Agar (PDA) medium plates as examined by Ammar and El-Naggar [4]. Single fungal colonies were picked from hyphal tips and grown on PDA for 7 days at 25°C for further examination of the mycological characteristics.

2.3 Morphological characterization

Colonies were described according to morphological characteristics, examined under microscope and the frequency (%) of the isolated fungi was recorded. The disease incidence was determined by counting the number of visible infected trees per farm in according to the total number of trees in each farm.

2.4 Pathogenicity test

A pathogenicity test was conducted for each fungal isolate separately. Date palm healthy tissues (3 date palm trees of each cultivar Khalas, and Barhi), were inoculated by the pathogen under greenhouse conditions (25 to 29°C and 12/12-h light/dark). From inoculated areas the fungus was re-isolated and colonies were maintained in PDA for morphological characterization

3. Results

3.1 Disease survey

Black scorch was found to be the main disease noticed during the survey in Al-Abdally and Al-Wafra farms. Disease incidence ranged from 1.0-1.78% in different locations. Symptoms often expressed as black scorched leaves, leaf malformation and characterized by partial to complete necrosis of the tissues.

3.2 Microscopic examination and morphological characterization

Microscopic examination and morphological characterization revealed that *Chalara paradoxa* (synonym = *Thielaviopsis paradoxa*) and *Chalara radicola* are the causal fungal pathogen of black scorch disease. The morphological characteristics of *Chalara radicola* isolates on PDA developed aerial mycelium with a light gray color, which later changed to black. *Chalara paradoxa* isolates on PDA developed aerial mycelium with a gray to gray-green color in culture plate.

3.3 Pathogenicity test

Pathogenicity test of both fungal pathogens reveals typical disease symptoms manifested within three weeks. Symptoms often expressed as black scorched leaves, leaf malformation and characterized by partial to complete necrosis of the tissues.

4. Discussion

Date palm diseases are among the major factors that affecting the products. Fungi are known as the most causal pathogens on date palm trees [5]. The present study showed limited spread of fungal diseases on date palm trees in the surveyed area because of the dry conditions and high temperature for most of the year. The results indicated that black scorch is widespread but high incidence of such diseases is expected especially in the absence of any control measures which may represent a real problem for date palm cultivation in future. Such diseases are common on similar climate conditions in other countries such as Saudi Arabia as reported by Al-Sharidy and Molan (2008). *Chalara paradoxa* (synonym = *Thielaviopsis paradoxa*) and *Chalara radicola* was the most predominant species isolated from visibly diseases palm of our survey and was pathogenic 10 days after inoculation, confirming Koch's postulates. Similar findings were reported by Hernandez [6]. Information from this study will help scientists to design effective strategies in controlling date palm diseases.

5. Conclusion

In conclusion, despite the diseases observed across the farms surveyed, we noticed that, most farmers lacked knowledge on disease identification and had limited resources for disease or insects management. In addition, they do not use any strategies to control diseases. There is need to educate farmers on infections diagnosis and management of palm diseases through field demonstrations and field guide as extension releases

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