Available Online at EScience Press
Plant Protection
ISSN: 2617-1287 (Online), 2617-1279 (Print)
http://esciencepress.net/journals/PP

FUNGI ASSOCIATED WITH OFF SHOOT DISEASES OF DATE PALM (*PHOENIX DACTYLIFERA* L.) IN KHAIRPUR DISTRICT OF SINDH, PAKISTAN

Mirza Hussian[1], Muzafar Husain Sirohi[2]
[1] *Department of Botany, Government Girls Degree Science College Gambat, Pakistan.*
[2] *Centre for Biodiversity and Conservation, Shah Abdul Latif University, Khairpur, Pakistan.*

ARTICLE INFO

Article history
Received: 6th June, 2020
Revised: 18th July, 2020
Accepted: 11th August, 2020

Keywords
Off shoot diseases
Fungal infections
Date palm tree
Frequency of occurrence

ABSTRACT

Off shoot diseases caused by fungi are considered of great importance because off shoot is essential part of life cycle of date palm tree and provides good medium for attacking many pathogens for their better growth. In the current study, fungi associated with off shoot of date palm were isolated and identified in the Khairpur district of Sindh, Pakistan. On the basis of morphological characters, three fungi viz. *Aspergillus quadrilineatus*, *Fusarium poae* and *A. niger* were isolated and identified from infected samples. The frequency of occurrence of these fungi was 3.87, 2.69 and 4.32 respectively. It was therefore concluded that increased microbial activities on suckers of date palm tree are often subjected to attack by fungal mycoflora and needs strict control measures for their protections.

Corresponding Author: Mirza Hussian
Email: mirzasamo512@gmail.com

INTRODUCTION

Date palm (*phoenix dactyiifera L*) is one of the oldest tree in the world and is mentioned in the Holy Quran and Bible. Date palm belongs to family Arecaceae or Palmaceae. Date palm is widely grown throughout the world especially in Asia, Africa, America and Australia (Al-Ani et al., 1971; Al-Harrasi et al., 2014; Chaughtai, 1986; Ismailli, 1999). Date palm is robust feathered and dioecious plant. The fruit drops with fleshy pericarps is borne in bunches and the yield may be as high as 30-100 kg per tree. These fruit bunches are borne at 5-7 years of age (Odejans, 1984). All parts of date palm tree are economically, commercially, culturally and religiously important. Date palm can be propagated by seed and by suckers taken from the base of mature female plants (Hornung and Mentz, 1999). It contains huge amount of fruit per plant and its fruit is rich in all essential nutrients which make the man healthy (Ishtique and Tarique, 1988). It is unavoidable fact that all animals and man depend upon plants as food is primary necessity for man and that is derived from plants. There are several pathogens of date palm such as nematodes, fungi, bacteria, viruses which cause serious plant diseases and destroy the economy of the region (Singh, 2018). Amongst several microorganisms, fungi are known as the severest pathogens. Diseases caused by fungi on date off shoots are considered of great importance and interest, because date off shoot is rich in essential part of life cycle and provides good medium for several fungal species for their luxuriant growth (Chaughtai, 1986; Dejerbi, 1982; Dowson, 1982; Ismailli et al., 1993). These infections are problematic wherever the date palm is grown. Due to the fungal infections there is maximum loss of date crop in field as the fungi are of great importance and interest (Ismailli et al., 2003; Khuskh, 1988). Keeping the aforementioned in view, in the

current study fungi associated with off shoot were isolated and identified.

MATERIALS AND METHODS

Samples of infected suckers of date palm (Figure 1, 2) were collected from experimental area with the help of sterilized forceps into polythene bags. Samples were brought to the laboratory for isolation and identification of fungal pathogens (Soomro, 1990). Czpepk's Dox Agar medium was used for the isolation of fungal pathogens. The medium in Petri plates was inoculated with the infected parts of date fruits. The inoculated Petri plates were incubated at 29 ^{o}C for 7 days. The individual colonies were picked and placed on fresh medium in the petri plates for purification of the fungi (Figure 3) The fungi were identified on the basis of different keys (Cook, 1963; Gilman, 1975; Thom and Raper, 1945).

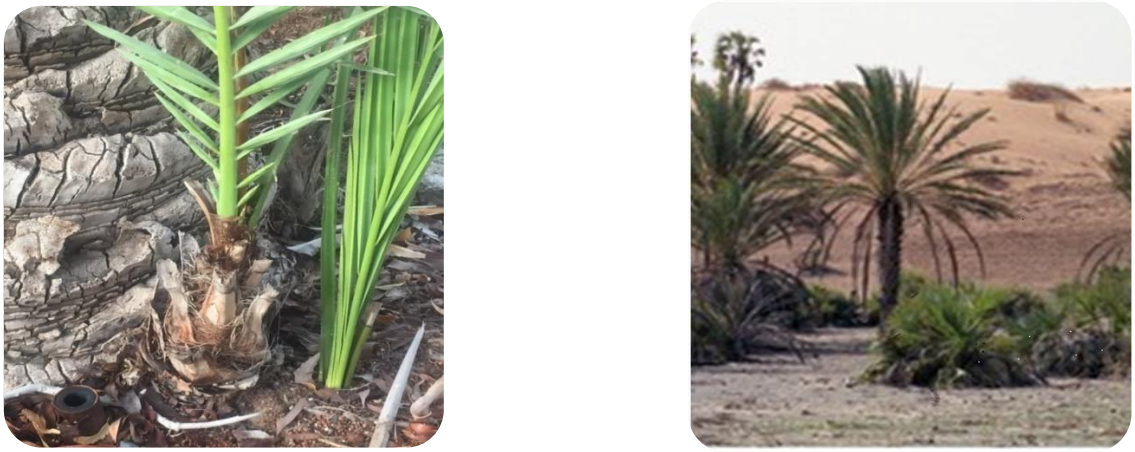

Figure 1: Date palm tree and its suckers.

Figure 2: Infected suckers (Off shoots) of date palm tree.

Figure 3: Growth of different fungi on artificial media.

RESULTS AND DISCUSSION

On the basis of morphological characters, three fungi viz. *Aspergillus quadrilineatus*, *Fusarium poae* and *A. niger* were isolated and identified from infected samples grown on Czpek's dox media showing pattern of conidia on conidiophore (Figure 4, 5, 6).

Figure 4: Colony pattern and conidia with conidiophore of *Aspergillus quadrilineatus on* Czpek's dox media.

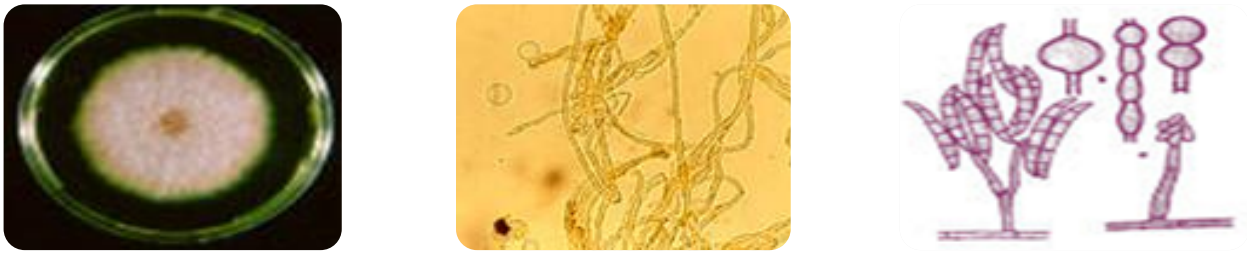

Figure 5: Colony pattern, hyphae and conidia with conidiophore of *Fusarium poae grown on* Czpek's dox media.

Figure 6: Colony pattern and conidia with conidiophore of *Aspergillus niger grown on* Czpek's dox media

The overall frequency of these three fungi is given in figure 7. Previously, research was conducted to point out off shoot diseases caused by fungal infections of date palm tree (Ismailli, 1999).

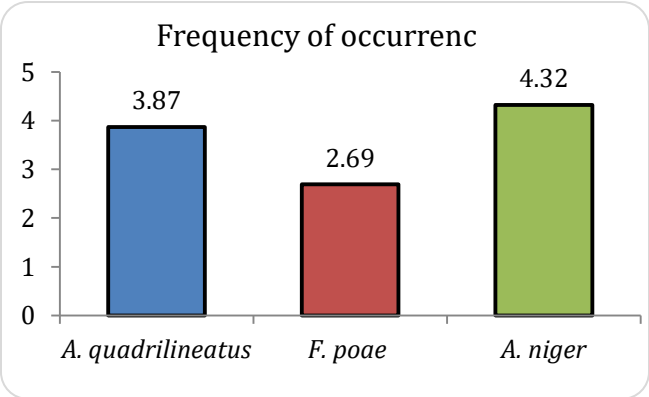

Figure 7: Frequency of different fungi in the studied area.

A great deal of fungi attacking date palm suckers has been reported associated with the moisture level of environment. Fungal infections play a key role in causing dangerous off shoot diseases (Hussain, 2012). The frequency of occurrence of these fungi was 3.87, 2.69 and 4.32 respectively (Figure 7). Furthermore, it was concluded that increased microbial activities on suckers of date palm tree are often subjected to attack by fungal mycoflora and needs strict control measures for their protections (Mahar and Bhatti, 1994).

Author Contribution

The author conducted the survey, isolated, purified and characterized the fungi, and wrote the manuscript.

Conflict of interest

The author declares no conflict of interest.

REFERENCES

Al-Ani, H.Y., El-Behadli, A., Majeed, H.A., Majeed, M.,

1971. Reaction of Date-palm cultivars to inflorescence rot and persistency and spreading of the disease. Phytopathologia Mediterranea 10, 57-62.

Al-Harrasi, A., Rehman, N.U., Hussain, J., Khan, A.L., Al-Rawahi, A., Gilani, S.A., M., A.-B., Ali, L., 2014. Nutritional assessment and antioxidant analysis of 22 date palm (*Phoenix dactylifera*) varieties growing in Sultanate of Oman. Asian Pacific Journal of Tropical Medicine 7, 591-598.

Chaughtai, G.H., 1986. Annual report of insects pests of date palm & their control at D.I. Khan, pp. 1-6.

Cook, W.B., 1963. A laboratory guide to fungi of polluted water, sewage and sewage system.

Dejerbi, M., 1982. New records on date palm diseases in United Arab Emirates (UAE)and Bahrian. . Date Palm Journal 1, 307 -308.

Dowson, V.H.W., 1982. Date production and protection: with special reference to North Africa and the Near East. Food and Agriculture Organization of the United Nations, Rome, Plant Production and Protection pp. 1-294.

Gilman, J.C., 1975. A manual of soil fungi. IOWA State College Press, USA.

Hornung, R.K.W., Mentz, C., 1999. Recent developments in the propagation of date palm (*Phoenix dactylifera*), II ISHS Conference on Fruit Production in the Tropics and Subtropics 531, pp. 223-228.

Hussain, M., 2012. Impact of rainfall (humidity) on the development of fungal diseases on date plam (*Phoenix dactylifer* L.) fruit at ripening stage at district khairpur Sindh, Pakistan. . University of Sindh, pp. 103-105.

Ishtique, M., Tarique, M., 1988. Physical properties of fruit, some indigence date palm cultivars grown at D.I. Khan. Sarhad Journal of Agriculture 4, 2271-2275.

Ismailli, N.J., 1999. Morphological and biochemical studies in dates at Khairpur. University of Sindh, pp. 87-88.

Ismailli, N.J., M.D., S., Z., M., 2003. Fungi occurring on dates (*Phoenix dactytifera* L) fruit during the rainy season in Khairpur district Sindh, Pakistan. Scientific Khyber 4, 110-111.

Ismailli, N.J., Soomro, A.Q., Zardari, M., Memon, M.S., Soomro, I., 1993. Fungi occurring on date palm, leaflets and inflorescence during rainy season in Khairpur Scientific Sindh Annual Journal of Research 1-9.

Khuskh, M.K., 1988. Role of different constituents in the development of date fruit of Khairpur district. University of Sindh, pp. 37-39.

Mahar, A.Q., Bhatti, N.M., 1994. Protection of date palm (*Phoenicx dactylifera* L.) from moonsoonic rains in district Khairpur , Sindh, Pakistan. Scientific Sindh 2, 85-93.

Odejans, B., 1984. Date palm in evolution of crop.

Singh, R.S., 2018. Plant Diseases. Oxford and IBH Publishing.

Soomro, I.A., 1990. Isolation and identification of dermatophytey and other keratinophilic fungi from the soil of Shah Abdul Latif University Khairpur Sindh Pakistan Scientific Khyber 3, 175-182.

Thom, C., Raper, K.B.A., 1945. Manual of the *Aspergillius*, The William and Wikins Co. Baltimore.