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OCCURRENCE AND DISTRIBUTION OF FUNGAL DISEASES ON DATE PALM IN DAKAHLIA AND DAMIETTA PROVINCE OF EGYPT.

Ghoneem, K.M.; S.A. El-Hadadd and A.E. Ismail
Mycol. Res. and Plant Dis. Surv. Dept., Plant Pathol. Res. Inst., Agric. Res. Center, Giza, Egypt.

ABSTRACT

A survey on the distribution, incidence and severity of date palm fungal diseases in the province of Dakahlia and Damietta was carried out. Eight fungal diseases were recorded from these locations. False smut, black scorch, basal leaf rot, leaf spot and fruit rot diseases showed the highest disease index, whereas, inflorescence rot, root rot and bending head diseases were lower in their index. The spreading of fungal diseases among date cultivars showed that, Zagloul was the most susceptible cultivar by false leaf smut; black scorch and fruit rot diseases.

Belkas in Dakahlia province showed to be the highest infected area with false smut, black scorch; leaf spot and fruit rot diseases, with percentages of 75, 37, 34 and 28%, respectively. Faraskour region in Damietta province recorded the highest infection percentage for Inflorescence rot (up to 18%) and root rot (up to 15%) diseases, while bending head disease recorded the highest infection percentage (up to 6%) in Damietta region. Subsequently, false smut disease presented the most predominant disease in all regions of Dakahlia and Damietta province.

A total of 17 genera and 24 species of various fungi were isolated from different affected parts of date trees. *Botryodiplodia theobromae* was the predominant isolated fungus followed by *Thielaviopsis paradoxa*, *Diplodia phoenicum* and *Fusarium oxysporum*. *Penicillium* sp., and *Melanospora zamiae* were recorded at low percentage.

INTRODUCTION

Date palm (*Phoenix dactylifera* L.) is one of the oldest fruit trees in the world and mentioned in the Bible and Qur'an. It is believed to be a native to the Arabian Gulf region, possibly Southern Iraq (Wrigley, 1995). The tree has a great socioeconomic importance in the desert regions of Southwest Asia and North African countries, as well as in some Mediterranean counties. Egypt is one of the top five date producing countries in the world (Andre-Botes and Zaid, 2002). In 2005, the total harvested area in Egypt reached 35,000 Hectare produced 1,170,000 Metric tons. This production represents 16.9% of world production (FAO, 2005). The plantations are spreading all over the country, but the main producing area is the Nile Valley, followed by the Nile Delta and the New Valley (Riad *et al.*, 1996). Several problems including desertification, sanding-up and diseases contribute to reduce cultivation and expansion of this tree. Under Egyptian conditions several fungal pathogens attack date palm and seriously affect the production.

Graphiola leaf spot caused by *Graphiola phoenicis* (Moug) Poit., is the most common and wide spread disease of date palms (Djerbi, 1983a&b and Abbas and Abdulla, 2004). Severe infection reduces the growth and production due to premature death of leaves. The disease has previously

been recorded on *P. dactylifera* in India, Egypt, Brazil (CAB International, 2003), Libya (Edongali, 1996), Kenya (Kung'u & Boa, 1997) and Qatar (Abbas and Abdulla, 2004).

Bending head is a minor disease observed in Algeria, Egypt, Mauritania and Tunisia. The central cluster of fronds takes the form of an erect fascicle with a bent tip. The trunk bends and may even break (Abbas and Sbdulla, 2003). *Thielaviopsis paradoxa* and *Botryodiplodia theobromae* Pat are fungi commonly isolated from declining palms (Zaid *et al.*, 2002).

Black scorch, also called medjnoon or fool's disease of date palms is a disease that occurs on stressed palms or senescent tree parts (Djerbi, 1998). The disease has been observed on date palm in all date growing areas of the world (Zaid *et al.*, 2002). It is caused by the fungi *Chalara radicicola* and *Chalara paradoxa* (*Thielavipsis paradoxa*) (Morgan-Jones, 1967; Upadhay, 1981 and Chase and Broschat, 1993). These fungi can infect any part of the palm tree. Decay is most serious when it attacks the terminal bud and heart leading to the death of the palm tree (Chase and Broschat, 1993 and Zaid and Arias-Jimenez, 1999). Increasing the salinity of the water used for irrigation tended to increase the infection rate (Al-Rokibah *et al.*, 1998). Also, poor cultural practices, particularly drought stress, had the greatest impact on trees growth and production (Suleman *et al.*, 2001a&b).

A number of leaf spot fungi cause variously shaped lesions on the leaf surface of many palm species. High rainfall or frequent overhead irrigation is often instrumental in their spread. Leaf spot diseases caused by various Fungi *i.e.*, *Alternaria alternate, Botryodiplodia thesobromae*, *Cladosporium* sp., and *Fusarium* sp. which affect a broad range of palms (Bhamsali, 1989 and Zaid *et al.*, 2002).

Khamedj or inflorescence rot is a serious disease affecting most date growing areas of the old world. The disease is caused by *Mauginiella scattae* Cav., which is always found in a pure state in affected tissues. The pathogen infected both male and female inflorescence and causes infection alternated from 5.7 to 38.64% (Badawy and Abdel Al, 1982). There was a higher incidence of the disease in male than in female inflorescences (Abdullah *et al.*, 2005). However, *Fusarium moniliforme* and *Thielaviopsis paradoxa* may rarely cause inflorescence rot (Djerbi, 1998 and *Zaid et al.*, 2002).

Fruit rot damages varieties from one year to another depending on the humidity and rain and also on the time of these factors from the Khalal stage until fruit maturation. The most common diseases causing fruit spoilage are the calyx-end rot caused by *Aspergillus niger* and the side spot decay caused by *Alternaria* sp. (Zaid *et al.*, 2002). Also, *Botrytis cinerea* and *Penicillium expansum* (El-Sayed, 1978), *Alternaria alternata*, *Aspergillus* spp., *Nigrospora* sp., *Fusarium* sp., *Cladosporium* sp., *Botryodiplodia* sp., *Rhizopus* sp., *Macrosporium* sp. and *Helmenthsoporium* sp. (Abdulsalam *et al.*, 1992; Khatri, 1997 and Ploetz, 2003) were the most common isolated pathogenic fungi from date palm fruits, while *Thielaviopsis paradoxa* was reported as a weak parasite (Al-Hassan and Abbas, 1983 and Baraka *et al.*, 1985).

Root rots disease, called a decline disease, caused by numerous fungi *i.e.*, two species of Omphalia (*O. tralucida* Bliss and *O. pigmentata* Bliss),

Alternaria, mellea, *Diplodia* sp., *Macrophomina* sp., *Pythium* sp., *Rhizoctonia* sp., and *Fusarium* sp. (Djerbi, 1983a&b, Elarosi *et al.*, 1983 and Djerbi, 1998, Abbas *et al.*, 1991 and Zaid *et al.*, 2002). A completely non-productive stage is the result of the attack Zaid *et al.*, 2002).

Since scanty information is available on the incidence and distribution of date palm diseases, the present investigation was aimed to: survey, detect and identify for the incidence and distribution of date palm diseases in Dakahlia and Damietta province (Egypt).

MATERIALS AND METHODS

Survey studies

During 2003 up to 2005, a survey on the distribution of date palm diseases in the province of Dakahlia and Damietta was carried out to determine the percentage of infection and disease severity of the following diseases: Graphiola leaf smut, black scorch, bending head, basal leaf rot, leaf spots, fruit rot, inflorescence rot (Khamedj) and root rot diseases.

Disease severity of Graphiola leaf smut was determined according to the scale of Sinha *et al.*, (1970). Disease severity of leaf spots was determined as follow: 0= healthy plant, 1= very small spots, 3= spots covered less than 20% of leaf surface, 5= spots covered from 21% to 50% of leaf surface, 7= spots covered from 51% to 75% of leaf surface and 9= spots covered more than 75% of leaf surface.

Fruit rot severity was estimated according to the scale that was described by Berahia *et al.*, (1959). 0= no infection, 1= less than 25% of fruit area was rotted, 2= 25-50% of fruit area was rotted, 3= 50-75% of fruit area was rotted, 4= 75% entire fruit was rotted, and 5= <75% was rotted.

Fungal isolation

Samples of naturally infected date palm tissues showed typical symptoms of Graphiola leaf smut, black scorch, bending head, basal leaf rot, leaf spots, fruit rot, inflorescence rot (Khamedj) and root rot diseases were collected from various districts in Dakahlia (El-Sembelaween, Temi El-Amdeed, Aga, Met Gamer, Belkas, El-Mansoura, Meniat El-Naser, Talkha and Dekerns) and Damietta (Damietta , Faraskoure and Kafr-Saad) governorates. The collected diseased plant parts were washed in running tap water followed by sterile water. Using sterilized scalpel, each part were cut into small pieces (1-2cm^2). Surfaces were disinfested by dipping pieces of the sample in 2% sodium hypocholorite (NaOCl) solution for 3 min., washed and dried between sterilized filter papers. The dried pieces were then transferred using sterilized forceps into Petri dishes containing potato dextrose agar medium (PDA) supplemented with mixure of the following antibiotics; L-Chloramphenicol, 5mg/L and Streptomycin Sulphate 5mg/L. Dishes were then incubated at 25°C and checked for microbial growth three days after planting. Purification of the resulting isolates was done using the single spore and /or hyphal tip technique. Pure cultures of the isolated fungi were obtained and all isolates were maintained on slants of Potato-Carrot Agar (PCA) for further studies. The detected fungi were identified in consultation with Commonwealth Mycological Institute (CMI) description sheets, and Raper &

Fennel (1965), Ellis (1971), Domsch *et al.*, (1980), Booth (1985) and Moubasher (1993).

Statistical analysis

Data were analyzed with the statistical analysis software; CoStat (2005). All multiple comparisons were first subjected to analysis of variance (ANOVA). Comparisons among means were made using least significant differences (LSD) at P=0.05 according to Gomez and Gomez (1984).

RESULTS

Survey

Data presented in table (1) show screening result for date palm varieties diseases in several regions of Dakahlia and Damietta province. Zagloul, Hayani, Bent-Esha and Seed palm cultivars are dominant in Dakahlia. The same cultivars, except seed palm, were dominant in Damietta . Eight fungal diseases were varied in their incidence were recovered from the studied locations. False leaf smut, black scorch, basal leaf rot, leaf spot and fruit rots diseases showed the highest disease index. Whereas, inflorescence rot root rot and bending head diseases were lower in their presence.

Among the studied regions, Belkas (Dakahlia governorate) recorded the highest disease index for false leaf smut, black scorch; leaf spot and fruit rot diseases, where they reached up to 75, 37, 34 and 28%, respectively. Faraskour regions in Damietta governorate recorded the highest infection percentage for Inflorescence rot (up to 18%) and root rot (up to 15%) diseases, while bending head disease recorded the highest infection percentage (up to 6%) in Damietta region.

In Dakahlia governorate, Zagloul cultivar showed the highest infection percentage of fruit rot disease (21.3%), while Seed palm cultivar recorded the highest infection by bending head and inflorescence rot diseases (5 and 13.3%, respectively). No significant difference was recorded in black scorch disease among all date palm cultivars (Fig.1). Zagloul, Hayani and Seed palm cultivars recorded the highest infection percentages of false leaf smut, root rot and basal leaf rot diseases, while Bent-Esha and Seed palm cultivars did not show any significant infection against leaf spot disease (17.7 and 25.7%, respectively). On the other hand, Bent-Esha cultivar recorded the lowest infection percentages by false leaf smut; root rot and fruit rot diseases (43.3, 3.0 and 4.3 %, respectively). No significant differences was recorded on infection percentages by bending head, inflorescence rot and leaf spot diseases among Bent-Esha and Hayani ; the two cultivars and Zagloul and Hayani and Zagloul cultivars, respectively.

In Damietta governorate (Fig.2), the highest infection percentage of false leaf smut and black scorch, diseases was recorded in Zagloul cultivar (33.3 and 20%, respectively). Zagloul and Hayani cultivars showed similar significant infection percentage by fruit rot disease (17 and 15.7% respectively). No significant differences were recorded by bending head; root rots; inflorescence rot and basal leaf rot diseases among all date cultivars, Hayani and Bent-Esha cultivars showed similar significant infection percentages by leaf spot disease (16 and 14.3%, respectively).

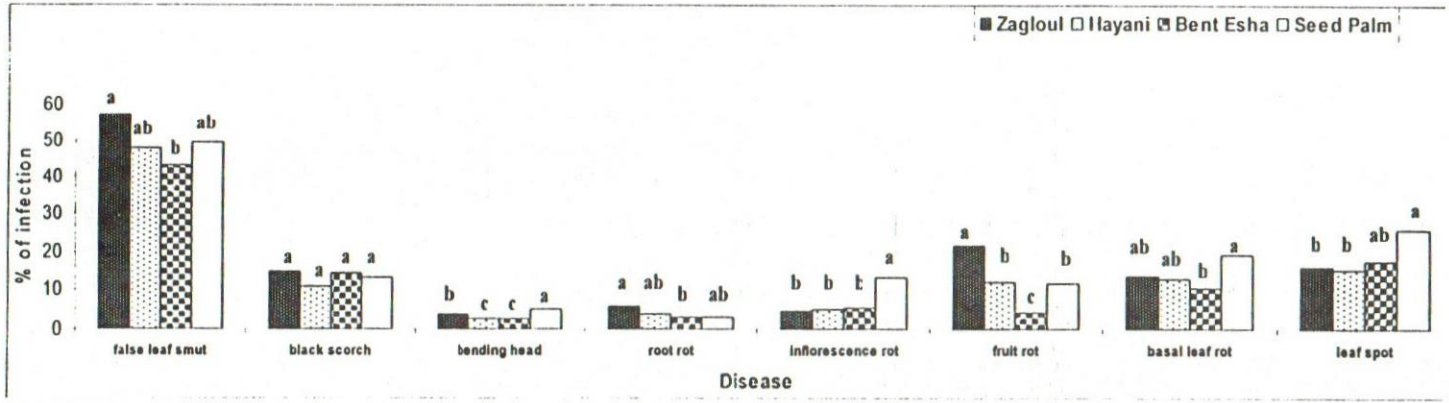

Fig (1): Naturally infected date palm cultivars by fungal diseases in Dakahlia province.

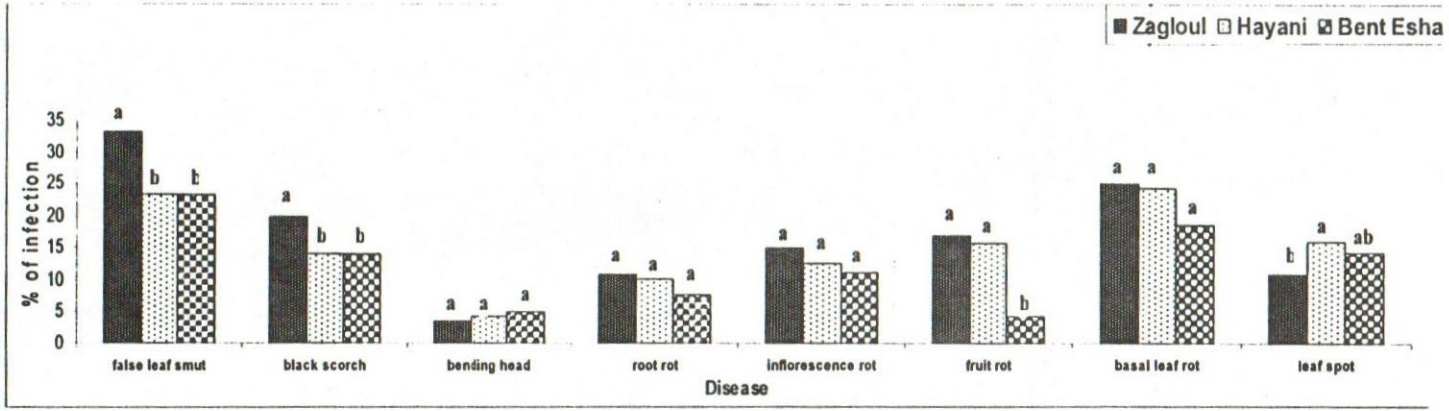

Fig (2): Naturally infected date palm cultivars by fungal diseases in Damietta province.

Table 1: Percent of date palm diseases in Dakahalia and Domitta province.

Location		Cultivars	Disease index (%)										
			False leaf smut		Bending head	Black scorch	Basal leaf rot	Leaf spot		Inflorescence rot	Fruit rot		Root rot**
			%	S./2C²*				%	D.S.		%	D.S.	
Dakahlia	El-Sembelaween	Zagloul	65	26 S	5	12	5	5	3	4	23	4	0
		Hayani	55	12 R	4	18	12	3	1	0	10	2	2
	Temi El-Amdeed	Zaglool	63	26 S	2	11	5	6	1	4	18	5	2
		Hayani	50	15 M	2	5	8	5	3	2	11	2	5
		Bent-Esha	45	15 M	2	8	9	8	3	2	4	2	0
	Aga	Zagloul	55	29 S	4	15	9	4	1	3	16	4	6
		Hayani	42	14 R	2	9	11	5	1	0	5	2	0
	Met Gamer	Zagloul	55	26 S	1	11	15	6	1	5	23	3	3
	Belkas	Zagloul	58	25 S	5	30	24	30	9	11	28	5	4
		Hayani	70	22 M	4	25	19	25	5	5	16	3	6
		Bent-Esha	64	15 M	2	21	17	30	7	10	5	2	5
		Seed palm	70	13 R	5	37	30	34	5	8	14	1	0
	El-Mansoura	Zagloul	52	30 S	4	13	23	20	5	4	22	4	10
		Hayani	34	12 R	2	10	22	22	5	9	17	2	2
	Sherbeen	Zagloul	60	28 S	3	14	10	24	3	5	25	4	5
		Hayani	43	17 M	2	15	5	23	3	8	13	2	3
	Meniat El-Nasr	Zagloul	54	30 S	5	14	15	18	3	3	18	1	12
		Hayani	44	18 M	2	5	14	19	5	5	5	4	5
		Seed palm	40	11 R	5	3	14	26	5	17	14	1	5
	Talkha	Hayani	52	26 S	3	5	17	22	5	12	17	4	6
		Seed palm	38	14 R	5	0	13	17	3	15	7	2	5
	Dekerns	Zagloul	52	28 S	4	12	18	29	7	4	23	4	10
		Hayani	43	25 M	5	5	6	13	3	3	15	2	5
		Bent-Esha	21	14 R	4	14	6	15	3	4	4	1	4
Domiatta	Damietta	Zagloul	75	35 S	6	21	24	9	5	13	20	4	15
		Hayani	64	20 M	4	15	33	15	3	14	10	2	10
		Bent-Esha	45	18 M	6	15	31	14	7	10	3	5	7
	Faraskour	Zagloul	70	30 S	5	24	36	10	7	18	14	2	12
		Hayani	63	25 M	4	15	28	15	7	13	15	2	14
		Bent-Esha	45	19 M	4	12	18	15	5	13	2	3	8
	Kafr-Saad	Zagloul	69	35 S	0	15	15	14	5	14	17	5	6
		Hayani	65	25 M	5	12	13	18	3	11	22	3	7
		Bent-Esha	40	18 R	5	15	7	14	5	11	8	1	8
	LSD at 5%		4.1	3.74	2.0	3.89	3.22	3.4	2.41	3.35	3.93	1.92	2.31

DS=Disease severity, S=Susceptible to infection, M=Moderately susceptible and R= Resistance to infection. *No. of pustules/2cm²

**No. of infected offsets/100 offset.

Isolation of date palm fungal pathogens

A total of 17 genera and 24 species of fungi were isolated from different infected parts of date trees Table (2). Such fungal species were recorded on date palm previously to cause bending head, root rot, inflorescence rot, fruit rot, black scorch, basal leaf rot and leaf spot diseases. *Botryodiplodia theobromae* was the predominant isolated fungus followed by *Thielaviopsis paradoxa*, *Diplodia phoenicum* and *Fusarium oxysporum*, while

Rhizoctonia solani, *Macrophomina phaseolina*, *Fusarium moniliforme*, *Alternaria alternate*, *Cladosporium herbarum*, *F. semitectum* and *F. equiseti* were present in moderate number. On the other hand, *Penicillium* sp., and *Melanospora zamiae* were rare.

Table 2: Fungi associated with date palm trees in Dakahlia and Domitta governorates.

Location	Cultivar	Part of tree	Isolated fungi	Frequency of isolates
Damietta & Met-Gamer	Hayani & Bent-Esha	Leaf, stem, fruit	*Alternaria alternata*	9
All Locations	Zagloul & Hayani	Fruit	*Aspergillus nidulans*	5
All locations	All cultivars	Fruit	*Aspergillus niger*	7
Belkas, El-Seenbelawin & Temi El-Amdeed	Zagloul Hayani & Seed palm	Leaf	*Botryodiplodia theobromae*	20
Temi El-Amdeed &Belkas	Zagloul & Hayani	Seedlings	*Chaetomium* sp.	2
Belkas Talkha & Farskour	Hayani & Seed palm	Leaf & stem	*Cladosporium herbarum*	8
El-Senbelawein & Belkas	Zagloul & Hayani	Leaf seedlings	*Diplodia phoenicum*	18
Temi El-Amdeed	Zagloul	Leaf	*Fusarium equiseti*	8
Temi El-Amdeed & Damietta	Zagloul	Root, stem	*Fusarium lateritium*	3
Belkas, Temi El-Amdeed & Damietta	Zagloul	Leaf, stem	*Fusarium moniliforme*	10
El-Senbelawein & Faraskour	Zagloul & Hayani	Root, stem	*Fusarium nivale*	4
Faraskour, Sherbeen & Meniat El-Naser	Zagloul Bent-Esha	Stem, root	*Fusarium oxysporum*	17
Belkas & Kafr-Saad	Seed palm	Leaf, stem	*Fusarium semitectum*	8
Belkas, Temi El-Amdeed & Kafr-Saad	Seed palm & Bent-Esha	Root	*Fusarium solani*	5
Damietta & Kafr-Saad	Zagloul & Hayani	Root	*Macrophomina phaseolina*	10
Mansoura &Temi El-Amdeed	Hayani & Bent-Esha	Leaf, stem	*Melanospora zamiae*	3
All locations	Hayani Bent-Esha & Zagloul	Fruit	*Myrothecium* sp.	6
All locations	All cultivars	Fruit	*Nigrospora* sp.	4
Belkas	Seed palm & Hayani	Root	*Omphali* sp.	5
Farskour	Hayani & Bent-Esha	Fruit	*Penicillium* sp.	2
Damietta & Kafr-saad	Seed palm & Hayani	Root	*Phomopsis* sp.	5
Belkas, Sherbeen	Seed palm	Root	*Pythium* sp.	4
Aga,Temi El-Amdeed & El-Senbelawein	Zagloul	Root	*Rhizoctonia solani*	12
Damietta, Belkas & Temi El-Amdeed	Zagloul, Hayani & Seed palm	Fruit, leaf, stem	*Thielaviopsis paradoxa*	18

The isolation trials of fungi from date seedlings and mature plant parts showed typical symptoms (Table 2). *Fusarium solani*, *Rhizoctonia solani*, *Pythium* sp., *Phomopsis* sp., *Macrophomina phaseolina* and *Omphelia* sp. were recovered from infected roots, and *Botryodiplodia theobromae* and *Diplodia phoenicum* from leaves, while *Penicillium* sp., *Aspergillus niger*, *A. nidulans*, *Nigrospora* sp., and *Myrothecium* sp. were isolated from fruits. *Fusarium oxysporum*, *F. nivale* and *F. lateritium* were isolated from both roots and stems, while *F. moniliforme*, *F. semitectium* and *Melanospora zamiae* were recovered from both stem and leaf. Moreover, *Alternaria* sp. and *Thiaviopsis paradoxa* were detected on stems, leaves and fruits.

DISCUSSION

Field survey and predication of crop loss are two important issues in the agricultural strategy. Early exploration of the pathogens at different agro-climatic conditions is a must. This helps demarcating disease free areas for quality plant production and provide information about the status, location of a disease and economic losses. Disease incidence and severity or crop loss have seldom been surveyed on date palm in Dakahlia and Damietta province, Egypt.

The results showed that false smut, black scorch, basal leaf rot, leaf spot and fruit rots were most predominant diseases in the province. Whereas, inflorescences rot, root rot and bending head diseases were lower in their presence. Our results are in agreement with the finding of Djerbi, 1983(a) and Zaid *et al.*, (2002). Variation in the percentage of disease incidence and severity among districts and cultivars might be attributed to one or more of the following factors: -

1) High humidity, precipitation and hot conditions in these regions which are relative to the spreading of most foliar diseases caused by fungi. In agreement with our results, Djerbi, (1983a&b); Zaid *et al.*, (2002) and Abbas & Abdulla, (2004) have recoded that, false leaf smut and inflorescence rot diseases are the most common and wide spread diseases of palm when cultivated under hot and humid conditions. In Egypt, the disease is considered as one of the common date palm diseases. It is widely spread in the Delta region and Fayum, but the disease is absent in the Oases while the humidity is lower (Zaid *et al.*, 2002). High humidity also affects on the date fruit during the maturation period, when fruits becomes soft, sticky and shows several cuts or breaks (Zaied and de wet, 2002). This creates a favorable condition for infection by rotted fungi; 2) Temperature is among the main factors affecting the incidence of date fungal disease of date. El-Deeb, (1994) studied the geographical spread of black scorch disease (*Thielaviopsis paradoxa*) in some of Egyption localities and isolated the pathogen from all examined locations, except the hot areas of the New Valley. On the other hand, Zaid *et al.*, (2002) found that, the infection of date trees by inflorescence rot disease was associated with neglected palm groves in hot and humid regions or in areas with prolonged heavy rain, 2 to 3 month before emergence of spathes; 3) Differences in age of date trees; which may be affect on the susceptibility of tree to infection. This was supported by Baraka *et al.*, 1985 who reported that, fruit varieties of date palm were more

susceptible to infection by rotted fungi in Rutab stage than Khalal stage; 4) the salinity of the soil and brackish water used in the irrigation of crops is a major concern in incidence and severity of many date palm diseases. Drought and salinity prevail are opportunistic to pathogens of black scorch disease, which become more aggressive and cause serious damage to date palms (Al- Rokibah *et al.*, 1998 and Suleman *et al.*, 2001a&b); 5) Agricultural practices including poor cultural practices, particularly drought stress, had the greatest impact on trees (Suleman *et al.*, 2001a&b). Also, wounds occurring during offset transportation or trimming of date trees process representing a good path for infection by fungal pathogens (Zaid *et al.*, 2002); 6) Fungal strain; this may be referred to the fact of palms are grown in monoculture on plantations, which tend to favor build-up of pathogens and races; 7) Soil types; which may be suitable for one pathogen than another and 8) interaction between pathogen and host.

The spreading of fungal diseases among date cultivars showed that, Zagloul cultivar is the most susceptible one by false smut; black scorch and fruit rot diseases. These data are also supported by the results of Solemon *et al.*, 1985, who tested the susceptibility of ten date palm cultivars grown under Egyptian conditions against the false smut pathogen, and concluded that Barakawy and Aglane were the most resistant cultivars compared to cultivated palm in Egypt. In Dakahlia governorate, no significant difference was recorded in black scorch disease among all studied date palm cultivars. Similar result was recorded by Djerbi (1983a&b), who observed the black scorch disease on 17 date varieties. Among which Hayani was one of the high susceptible cultivar.

A total of 17 genera and 24 species of fungi were isolated from different infected parts of date trees. Such fungal species were recorded on date palm previously to cause bending head, root rot, inflorescence rot, fruit rot, black scorch, basal leaf rot and leaf spot diseases. The great difference in the frequency of the isolated fungi from a cultivar may be attributed to some environmental factors including, soil inhabitant microorganisms, cultural practices and pest control management.

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تواجد وتوزيع أمراض نخيل البلح الفطرية الشائعة في منطقة الدقهلية ودمياط بمصر

خالد محمد غنيم – صفوت عبد الحميد الحداد – عادل الصادق اسماعيل

قسم بحوث الفطريات وحصر الأمراض – معهد بحوث امراض النباتات – مركز البحوث الزراعية – الجيزة – مصر

أجرى حصر لانتشار وشدة الإصابة بأمراض نخيل البلح في محافظتي الدقهلية ودمياط بمصر ، حيث اكتشفت ثمانية أمراض فطرية تباينت في درجة تواجدها. فقد سجلت أمراض التفحم الكاذب وعفن قواعد الأوراق وتبقع الأوراق وأعفان الثمار أعلى مدلول مرضى في حين سجل عفن طلع النخيل (مرض خناس الطلع) وعفن الجذور وانحناء الرأس أقل مدلول مرضى. أظهرت النتائج أيضا أن الصنف زغلول هو أكثر الأصناف حساسية للإصابة بأمراض التفحم الكاذب واللفحة السوداء وأعفان الثمار.

سجل مركز بلقاس بمحافظة الدقهلية أعلى تواجد مرضى لكل من التفحم الكاذب واللفحة السوداء وتبقع الأوراق وأعفان الثمار حيث سجلت ٧٥ و ٣٧ و ٣٤ ، ٢٨% على التوالى ، في حين سجل مركز فراسكور بمحافظة دمياط أعلى نسبة اصابة بمرض عفن طلع النخيل (١٨%) وعفن الجذور (١٥%). سجل مرض انحناء الرأس أعلى نسبة للاصابة (٦%) في مركز دمياط. وعموما فقد لوحظ أن مرض التفحم الكاذب في النخيل كان الأكثر شيوعا في كلا المحافظتين.

ولقد تم عزل ١٧ جنس و ٢٤ نوع من الفطريات من مختلف الأماكن المصابة لأشجار النخيل حيث وجد أن الفطر *Botryodiplodia theobromae* هو الأكثر شيوعا بين العزلات الفطرية المختلفة تلاه *Thielaviopsis paradoxa* ثم *Diplodia phoenicum* ثم *Fusarium oxysporum* في حين تواجد *Penicillium* sp. و *Melanospora zamiae* بدرجة أقل.