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INSECTS ASSOCIATED WITH INFLORESCENCE ROT DISEASE OF DATE PALMS IN IRAQ

Jameel S . Matani

Biology Department , College of Science , Babylon University , Iraq

ABSTRACT

Four species of insects , *Carpophillus obsoletus* Er . , *Carpophilus* sp . , *Bitoma lyctiformis* Woll and *Scatopse* sp . , were found in association with infected spathes of date palm with *Mauginella scaettae* Cav . The later fungus was the dominant species isolated in pure cultures both from diseased spathes and from contaminated insects . *Bitoma lyctiformis* is the first record for Iraq .

INTRODUCTION

Iraq is one of the principal date - producing countries in the world . The annual production is estimated to be 350 000 tons which is about 20 % of the world production . However , the productivity of a single date palm tree in Iraq has been estimated to be not more than 25 Kg . per year . This is very low to that of 90 Kg . per tree in the U . S . A . (Al - Baker , 1972) .

A major reason for this low productivity is the inflorescence rot disease of date palm caused by the fungus *Mauginella scaettae* . (Allison , 1952) and (Leville , 1966) considered this to be the most important disease of the 30 million palms in the Tigris and Euphrates valley between Baghdad and the Arabian Gulf . (Al - Ani *et . al* . 1971) found that more than 65 % of the date palms in some district were effected by the disease .

Extensive studies on the pests of date palm in Iraq have been made by Hussain (1963 a , 1963 b , 1969 , 1974) This paper , therefore . Attempts to provide information about the insects associated with inflorescence rot disease of date palms in Iraq .

MATERIAL AND METHODS

Collection of material : one visit to each of the 6 date palm orchard in Basrah province (Table 1) was made during the period from March to May 1990 and in April 1991 . Infected pathes of date palm were removed from the trees and placed in plastic bags . The samples were taken to the laboratory and kept in the incubator at 20 C for further studies .

Infected spathes were examined under the dissecting microscope and adult insects were removed from the source materials and transfered to small jars . Insect specimens were sent to the British Museum (Natural History) for identification (Table 1) . All the four species identified were used during this experiment .
Larvae of some insects found feeding on the decaying inflorescence date palm were also collected .

Isolation of fungi from diseased material : Infected parts of inflorescence were cut into small pieces and surface treated with 0.5 % sodium hypochloride for five minutes , washed three times in sterile water , plated on sterilized PDA medium (Potato 200 g , dixtrose 15 g , Agar 20 g , distilled water 1000 ml .) in petridishes and incubated at 25 C . Each plate contained 15 ml . of PAD containing 1 ml . of 1000 PDA solution of chloramphenicol in water as a bactericide .
Isolation of fungi from contaminated insects : Insects were examined under a microscop for the possible contamination by conidia or mycelia of the pathogen and were plated on PAD media with chloramphenicol . Larvae of some insects were treated in the same way .
The role of adults transfering the pathogen : Experiments were conducted in the laboratory 22 - 26 C . Five healthy male spathes of cultivar khikry were used . E ach spathes was kept in a sterile jar of the dimensions 15 x 20 x 45 cm and the jar covered with a plastic bag . Each spathe in each of the four jars was exposed respectively to 10 contaminated insects of a particular species . The fifth jar was not exposed to contaminated insects .
In another experiment a spathe infected by the fungus with a number of insects on it and a healthy spathe were taken and each kept separetely in a sterile glass jar . The two jars were then connected through their open ends and left for 10 days in the laboratory at 22 - 25 C . Four such experiments were set up simultanously with the four insects species collected in this study .
The role of larvae in the dissemination of the pathogen within the spathe : Three healthy opened spathes of male cultivar khikry were used . The first one was inoculated with two mycelial discs *Mauginella scaettae* . The discs were out by sterile cork borer from the periphery of 10 days old caltures of the pathogen on PDA in petri plate . The second spath was inoculated with two contaminated larvae of *Scatopse* sp . Picked up by a sterile forceps from decaying male inflorescence infected with the pathogen .
The third spathe was used as control . All spathes were kept seperately in sterile glass jars and covered with plastic bags and kept for 10 days in the laboratory .

RESULTS AND DISCUSSION

Four species of insects , *Carpophillus obsoletus* Er . , *Carpophilus* sp . , (Coleoptera : Nitidulidae) , *Bitoma lyctiformis* Woll (Coleoptera : Colydiidae) and *Scatopse* sp . , (Diptera : Scatopsidae) , were found associated with decaying inflorescences of date palm collected from different sites in Basrah province in March to May 1990 and April 1990 (Table 1) . In this connection it may be mentioned that *Bitoma lyctiformis* is the first record for Iraq.

All the reported insects were collected from infected spathes with the pathogen *Mauginella scaettae* Cav. Probably these insectes were attracted by the smells of the pollen grains and the rotted materials.The fungus *Mauginella scaettae* was the dominant isolated from decaying spathes and from contaminated insects collected from infected spathes (Table2).

Other species such as *Trichothecium roseum*, (Helotiales : Orbiliaceae) *Alternaria* sp. (Moniliales :Dematiaceae) , *Aspergillus* sp. (Moniliales: Moniliaceae) , *Rhizopus* sp. ,(Mucorales: Mucoraceae), and *Penicillium* sp. (Hypocreales: Trichocomaceae) were also isolated both frominfected spathes and from insects, whereas, *Chaetomium elatum, C. murorum* and *Chaetomium* sp. ,(Pleosporales: Chaetomiaceae), were isolated only from decaying material. All these species are well known saprophytes .

Carpophilus obsoletus and *Carpophilus* sp. , with other species of the same genus (*Carpophilus dimidiatus, C. hemipterus* and *C. ligneus*) have been reported to be of economic importance on dates in several countries including Iraq in causing damage to ripening dates on trees and on the ground (Lindgren and Vincent 1953, Abo El-Ghar and Rafie 1964, Hussain *et al.* 1971 and Martin, 1958). Al-Ani (1977) mentioned that larvae of *Scatopse* sp. were found on decaying materials of *Citrus* in Baghdad during April.

The laboratory experiments showed that contamimated insects of the four species whenkept each in a separate sterile jar together with healthy spathes did transfer the pathogen . Symptoms of the disease developed within seven days whereas the control remained healthy . *Mauginella scattae* was readily reisolated from the infected spathes . Similar results were obtained when chambers containing infected spathes carrying the insects and healthy spathes were connected .

When healthy spathes were inoculated each seperately with mycelial discs and contaminated larvae of *Scatopse* sp . , Similar symptoms were also developed .

The infection was , however , faster during the first four days with the mycelial discs than with the contaminated larvae . But at later stages the whole spathe inoculated with the larvae was found affected by the pathogen , while the spread of the disease on the spathe inoculated with mycelial discs was restricted around the inoculation sites .

This evidence suggest that the larvae have a positive role in the dissemination of the pathogen which cause the disease within the whole spathes due to their movement .

The four insect species which were found on infected spathes play a role in transferring the pathogen to different parts of an infected spathes but no clear evidence at this stage of the study to prove the role in transmitting the pathogen from infected spathes of a tree to healthy spathes in another tree .

Table 1 : Collection details of insect species :

Source	Date	Insect
1- Decaying male inforescence of cultivar khikry infected with *Mauginella scaettae* .	Shatt - Al - Arab Basrah , May , 1990	Adults of *Carpophilus obsoletus* .
2 - Decaying male inflorescence of cultivar khanamy infected with *M. scaettae* .	Fao , Basrah , May 1990 .	Adults of *Carpophilus* sp.
3 - Decaying male inflorescence of cultivar khikry infected with *M . scaettae* .	Gurna , Basrah , April , 1991 .	Adult and larvae of *Scatopse* sp .

4 - Decaying male inflorescence of cultivar khanamy infected with *M. scattae*.	Abul khasib, Basrah, April 1991.	Adults of *Carpophilus obsoletus*.
5 - Decaying female inflorescence of cultivar sayer.	Shatt Al - Arab, Basrah, April, 1991.	Adult of *Carpophilus obsoletus*.
6 - Decaying male inflorescence of cultivar khikry.	Shatt Al - Arab, Basrah, April, 1991.	Adult of *Bitoma lyctiformis*.

Table 2 : Fungi isolated from decaying spathes and from adults and larvae of four insects found in association with infected spathes with *Mauginella scaettae* :

Source material	Fungi isolated
1 - Different decaying parts of infected spathes.	*Mauginella scaettae*, *Trichothecium roseum*, *Alternaria* sp., *Chaetomium* sp., *Chaetomium elatum*, *C. muorum*, *Aspergillus* sp., *Rhizopus* sp., and *Penicillium* sp.
2 - Adults of *Carpophilus obsoletus*.	*M. scaettae*, *Aspergillus* sp., and *Trichothecium roseum*.
3 - Adults of *Carpophilus* sp.	*M. scaettae*, *Aspergillus* sp., and *Rhizopus* sp.
4 - Adults of *Scatopse* sp.	*M. scaettae*, *Rhizopus* sp.
5 - Larvae of *scatopse* sp.	*M. scaettae*, *Rhizopus* sp. and *Aspergillus* sp.
6 - Adult of *Bitoma lyctiformis*.	*M. scaettae*, *Alternaria* sp.

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Insects associated with inflorescence rot disease of date palms

الحشرات المصاحبة لمرض خياس طلع النخيل في العراق

جميل سعد متاني

قسم علوم الحياة – كلية العلوم– جامعة بابل – بابل – العراق

الخلاصـــــــــة

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اربع انواع من الحشرات – *Carpophilus* sp. *Bitoma Carpophilus obsoletus Er* . وجدت مصاحبة لطلع النخيـــل *Carpophihus sp.* , *Bitoma lyctiformis Woll* , *Scatops* sp المصاب بالفطر *Mauginella scaetta Cav*.

الفطر Mauginella scaetta Cav. كان النوع السائد بين الفطريات المعزولة من مزارع نقية احدث من طلع مصاب ومن حشرات ملوثة . الحشرة *Bitoma lyctifomis* سجلت لاول مـــرة في العراق.