

Incidence and Severity of Sooty Canker Disease on Date Palm in Northern State, Sudan

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ABSTRACT

Surveys related to sooty canker disease (branch wilt disease) of date palm (*Phoenix dactylifera* L.) were conducted during the period 4/6/2013 - 4/6/2014 in the Northern State of the Sudan. The objectives were to identify the causal agent of this disease, and to study its incidence, occurrence, and severity disease symptoms on different hosts. Surveys covered 50 orchards in different regions of four Localities, namely, Halfa, Dongola, El daba, and Marawi. Isolated pathogens were identified based on morphological characteristics. Symptoms of the disease in date palm first appeared as chlorosis on the tip of the leaf followed by necrosis and dryness, then trees wilt and die-back. Black sooty canker layers of spores appeared when the infected parts were removed from infected areas. The occurrence of the sooty canker disease distribution was high incidence of the disease in Halfa and Marawi (31.7, 26.3%), respectively, compared with Dongola (20.7%) and Eldaba (21.3%), and disease severity was high in Halfa and Marawi (28, 22 %), respectively, compared with Eldaba (18%) and Dongola (16%) .The disease incidence in all surveyed regions was high, ranging between 41-20%, with disease severity between 28-16%. The mean infection level in date palm was high (25%), as compared with that in mango, citrus, and ficus trees (13.5%). Among pathogenic fungi isolated was *Natrassia*

mangiferae, a major causal agent of sooty canker disease. The fungus was the most dominant species (25%) detected in all samples examined, followed by *Diplodia phonicum* (11.5%) and *Thielaviopsis paradox* (10.5%). Since date palm is an economic crop in Northern State, management of *N. mangiferae* should be stressed in future research.

Keywords: (*Phoenix dactylifera*), fungal pathogen, sooty canker, *Nattrassia mangiferae*

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1. INTRODUCTION

Date palm (*Phoenix dactylifera* L.) is widely cultivated in the arid regions of the Middle East, North Africa and arid sub-Sahara areas such as the Northern Sudan for its economic values (Purseglove, 1981). In the Sudan, it is grown mainly along the Nile valley in the Northern State which extends from latitude 22°N to latitude 15·5°N in the South (Salih, 2003). Small numbers of date palm trees are also grown in Khartoum State, Nile State and Darfur States (Ahmed, 2003). Date palm plays important role in the local economy in the Northern Sudan (Mahadi, 2001). Besides marketing, produced dates are consumed as food for its high carbohydrates content. Moreover, date palm trunk is used for house building or furniture's, the fiber for ropes, the flower stalks for weaving baskets, pollen grains mixed with honey for human consumption, stones of fresh fruits for animal feed or mixed with milk for medicinal purposes. The date palm trees are also grown for shade or prestige values (Osman, 1979).

Under local conditions, date palm trees are vulnerable to infection with some destructive diseases, which are responsible for decline and considerable losses in the number of trees (Bliss, and Djerbi, 1983). Several soil-borne fungi attack date palm causing root rot, wilt and decline diseases (Elarosi *et al.*, 1983). The dominant fungi associated with date palm death and decline were *Fusarium oxysporum*, *Diplodia phoenicum*, *Ceratocystis radicularis*, and *Phonopsis phoenicola* (Ellis, 1976; Rottan and Al-Dboon, 1980; Mousiri *et al.*, 2001). *Nattrassia mangiferae* causes wilt and

sooty canker disease of date palm (Elshiekh, 2004). The disease sooty canker was observed in date palm in Sudan during a survey undertaken by Ahmed and Yassin (1992). The fungus, *N. mangiferae*, was identified to be the causal organism of the sooty canker of date palm (Baghdadi *et al.*, 2003).

According to Elshiekh (2004), the symptoms of sooty canker disease caused by *N. mangiferae* on date palm include; general wilt of the trees and maceration of off-shoot in which the leaves become almost white. Cross-section in diseased off-shoot revealed black layer of sooty masses of arthrospores. Black colour and destruction of conductive system. Trunks of the infected trees become small and the roots turn to black colour. Leaf bases are easily detached and the fibers turn to cottony texture. *Nattrassia* is a polymorphic fungus that has two spore stages, the pycnidial and the arthroconidial (*Scytalidium* state). Sutton and Dyko (1989). Revised the genus *Hendersonula* and created the new monotypic genus *Nattrassia*, whose type species is *N. mangiferae*. Earlier synonymic names for this fungus have been *Dothiorella mangiferae*, *Exosporina fawcettii*, *Fusicoccum eucalypti*, *Hendersonula cypria*, *H. agathidis*, and *H. toruloidea*. The arthric syanamorph is known by the name *Scytalidium dimidiatum*, also *Torula dimidiata*, and *S. lignicola*. A sexual stage for *Nattrassia* has not been described (Elliott and Edmonds, 2004). The sooty canker disease of date palm causes loss of yield (30-60%), as well as high loss of mature trees and off-shoot in the main growing areas in the Northern State (Elshiekh, 2004). The symptoms and activity of *N. mangiferae* are reported on Persian Walnut (Wilson, 1949, and Ogawa, 1954), citrus (Calavan and Wallace, 1954), fig (Paxon *et al.*, 1964), and grapevine (Wangikar, Raut and Gapalkrishna, (1975). They also reported on *Ficus bengalensis* (Giha, 1975), *Gmelina orborea* (Nair, 2001), *Ficus nitida* (Nori, 1996), date palm (Elshiekh, 2004), *Accacia* (Eltaher, 2004) and mango (Abed–Elkarim, 2004).

The specific objectives of this study were to:

- i) Survey occurrences of the disease incidence and severity of the sooty canker disease of date palm on different hosts in the Northern State of Sudan,
- ii) Isolate and verify identify of main causal agents of sooty canker on date palm trees.
- iii) Symptoms of infected plant to verification and confirmation the causal agents of sooty canker on date palm trees.

2. Materials and Methods Survey of the sooty canker disease

1.1. Occurrence, incidence and severity of disease

The survey was carried out during the period 04/10/2013 - 5/06/2014 covering different area in five Localities, viz., Halfa (Firage, Abri, Dalgo, Oshamato, Saadinfanti, Sabo, Saadeenkorta), Dongola (E.Labab, Gordote, Dongola, Elborgig, Abufatma, Argo), Elgolid, Eldaba (Elgaba, Hamoor, Elcarad, Bnganarti, Eldaba, Goshabi), and Marawe (Elgorar, Marawi, Karima, Tangasi), in the Northern State of the Sudan. The area is located between latitudes 16- 22° N and longitudes 20 -32° E. The distribution of infection and severity of the disease on date palm trees were determined. The samples in in respective of date palm cultivars. Each tree showing foliage symptoms such as chlorosis and necrosis wilt, drying and white coloration and presence of sooty black layer of spores on the leaf bases or off-shoots were reported. Characteristic of *N. mangiferae* was counted as number of infected parts showing sooty canker.

In each inspected orchard twenty to thirty trees were chosen randomly for the study. Disease incidence was calculated as follows:

$$\text{Disease incidence (\%)} = \frac{\text{Number of diseased trees}}{\text{Total number of trees surveyed}} \times 100$$

The disease severity was also estimated based on a scale classified into five categories, depending on the diseased parts included (Waller et al., 2002) These categories were as follows:

Guide of Deterioration	% of diseased part of the tree
0	Healthy (no disease symptoms)
1	1-25
2	26-50
3	51-75
4	76-100

Disease severity was calculated as follows:

$$\frac{\text{No. of trees} \times \text{Category (0)} + \dots + \text{No. of trees} \times \text{Category (4)}}{\text{Total number of tested}} \times 100 = \text{Disease severity}$$

Collective of infected plant samples

Random samples from infected trees and off-shoots were collected from foliage, bark basal part of the inner most leaves, terminal bud and root of infected date palm trees and off-shoots. Woody samples were taken by means of borer, which was inserted into the infected stem or root to depth of 5 cm. The samples of each tree were kept inside polythene bags, kept in a refrigerator for further analysis, and transferred to the laboratory of plant pathology- Plant Protection Directorate/ Ministry of Agriculture.

Isolation of microorganism

For isolating the causal agents from plant materials, samples from infected plant parts were cultured on PDA medium in the laboratory. Small pieces of 5 mm size from diseased tissue, root, leaves, bud, and inside tissue were surface sterilized with 0.1% mercuric chloride for one minute, then washed thoroughly in three changes of sterile distilled water and dried up on filter paper. Each sample was placed at the centre of Petri-dish (PDA medium) using a needle flamed to redness and then cooled. All cultures were inoculated at room temperature (25-30C°), the fungal growth was observed daily.

Identification of the fungus

Infected plant tissue was placed on Potato Dextrose Agar medium (PDA), the causal organism was isolated from diseased tissue, the vegetative mycelium of the isolate in pure culture on PDA at room temperature (28+2c°).

The fungus, *N. mangiferae*, was identified based on morphological and histological features as described by Ellis (1976). And other fungi such as *Diplodia phonicum* and *Thielaviopsis paradoxa*, *Fusarium* spp. ,*Rhizoctonia* spp , *Ceratocystis paradoxa*

After 1-3 days of cultures inoculation the microorganisms were examined under light microscope.

Descriptions of symptom

Descriptions of symptoms from infected date palm trees to verify the causal agent of sooty canker disease.

Statistical analysis

The data collection of survey were analyzed using randomized complete block design; the results were statistically analyzed using SAS program at a probability level of 0.05.

3. RESULTS

Occurrence of incidence and severity of sooty canker disease

Following reconnaissance survey, in the Northern State of Sudan, manifested severe incidence of sooty canker disease caused by *N. mangiferae* in the areas cultivated by the date palm, namely, Halfa (Firage, Abri, Dalgo, Oshamato, Saadinfanti, Sabo, Saadeenkorta), Dongola (E.Labab, Gordote, Dongola, Elborgig, Abufatma, Argo), Eldaba (Elgaba, Elgolid, Hamoor, Elcarad, Bnganarti, Eldaba, Goshabi), and Marawi (Elgorar, Marawi, Karima, Tangasi). The total fields surveyed include 50 fields (Table 1).

Among orchard trees surveyed, date palm showed the highest infection by sooty canker caused by *N. mangiferae*. The occurrences of the sooty canker disease incidence was high in Halfa and Marawi (31.7, 26.3%) but lower in Dongola and Eldaba (20.7, 21.3%), respectively (Table 1). Comparing different areas within these Localities, Table 1 revealed that the disease incidence of sooty canker on date palm is high in Dalgo (41%), Argo (35%), Elkarad (36%), and lower in Hamoor (21%), Elgaba (16%), and Benganarti (2%). Accordingly, the disease incidence in all surveyed regions was considered high, ranging between 2-41% with disease severity between 16-28% (Table 2). However, the disease was detected on date palm trees of different ages ranging from off-shoot to mature trees.

Distribution of microorganism isolated

Nattractia mangiferae was highly distribution on date palm with the other fungi in the Northern State (Table 3). Table (3) showed the frequency of microorganism isolated from date palm at different locations in the State. *Nattractia mangiferae* was the most dominant species isolated (25%) from all samples examined than other fungi, followed by *Diplodia phonicum* (11.5%), and *Thielaviopsis paradoxa* (10%). Barakawi is a highly susceptible variety but Jawa is resistant based on the disease symptoms. (Table 4-A). Infestation of other trees species were also reported but with lesser distribution such as *Citrus* spp., *Pasidium* spp., Mango, *Ficus* spp., and Eucalyptus (Table 4-B).

Confirm verification of causal agent of sooty canker.

Morphological identification of the fungus associated with sooty canker disease on date palm trees.

The fungus *N. mangiferae* was constantly isolated of almost all symptomatic tissues examined of date palm trees and it initial identified based on its morphological characters. The mycelia (Plate 1) were fast growing filling the entire Petri dishes within 5-7 days. The structure of the fungal culture was thick and the colour was dark brown to black, the colony of *N. mangiferae* effused dark blackish brown to black (Plate 2). The fungal mycelia were in chain structure and fragmentation of these mycelia formed cylindrical or barrel like structure, brown 0-2 septa arthro conidia (Plate 3) (Pasha, 2007). However, the pycnidia formed at canker lesions and beneath barks of the infected date palm tree were noticed to be dark brown to black containing cylindrical conidia with also 0-2 septa translucent developed to be brown at maturity. Verification of sooty canker disease causal agent according to(Ellis ,1976; Sigler et al., 1997; Farr et al., 2005; Crous1 et al., 2006; Al-Saadoon et al., 2012) were conductive. Other fungi verify and identify such as *Rhizoctonia* spp have distinctive irregular brown sclerotia are formed by some species on diseased plant tissues, *Fusarium* spp Colonies produce violet to purple pigment in agar and mycelium, According to (Burgess *et al.*, 2008). *Diplodia phonicum* Conidia are dark brown, ovoid, obtuse at the apex and truncate or round- ed at the base and with the wall apparently rough. Immature spores are aseptate and form darker brown, single septate spores as they mature (Phillips, *et al.*, 2007). *Thielaviopsis paradoxa* forms thick walled resting spores, chlamydospores, and produces infective asexual spores or conidia. T. paradoxa produces two types of conidia; the first type is hyaline, cylindrical and small microspores of $8.5-12.7 \times 2.5-4.7 \mu\text{m}$ in size ((Ellis, 1976)

Description of symptoms

Depending on the severity of infection many symptoms of sooty canker disease according too (Elshiekh, 2004 ; Baghdadi *et al.*, 2003 ;Pasha, 2007) were recorded :-

1. Leaf chlorosis:

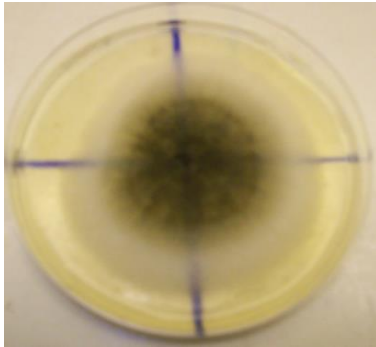
Showed different shades of chlorosis, (yellowing), rolling of the leaves starting from the upper part of the trees downwards.

2. General wilt:

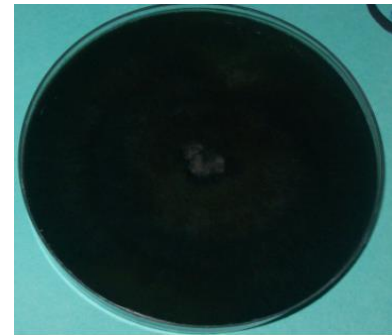
Infected trees became wilted and maceration of the off-shoot in which leaves became almost white.

3. Leaf dryness and die back (Plate 4, 5).

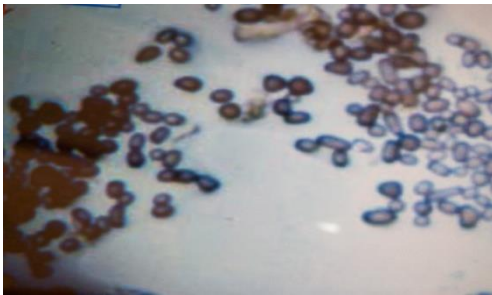
4. Leaf basis peeling off (Plate 6)
5. Cross section in diseased off-shoot revealed black layer of sooty masses of arthrospores,
6. The trunk of infected trees became small and the root turned thin black colour.
7. The leaves of the heart easy to remove and became black with smooth sooty layer (Plate 7).
8. Death of heart of trees, ended with black coloration.
9. Leaf bases were easy to cut and the fiber turned to cottony texture (Plate7)
10. Conductive plant system (xylem) turned to black in colour and destroyed.



**Plate 1. *Natrassiamangiferae* on
on
PDA; 3days old culture.**



**Plate 2. *Natrassiamangiferae*
PDA; 7days old culture**



**Plate 3. Arthrospores of the upper
and downward**



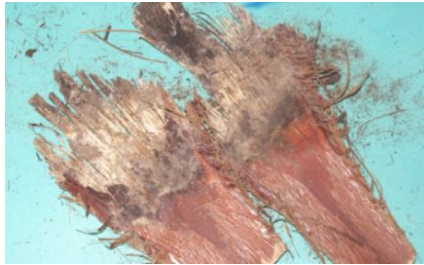
**Plate (4). Chlorosis of the tree from
fungus *N.mangiferae***



Plate (5). Chlorosis of the tree from upper and downward



Plate. (6). Infected leaf base (could easily be detached).



A



B



C

Plate (7). A, B. and C. black sooty layers of arthrospores on date palm. A). Inner part of leaf base, B). leaf base and C). heart of date caused by *Natrassia mangiferae*

Table 1. Disease incidence on date palm field in different Localities in Northern State.

Locality	Area	% infection
	ELkarad	36
	ELgaba	16
ELdaba	ELdaba	24
	Benganarty	2
	Hamoor	21
	ELdaba	29
	Means	21.3
Dongola	ELbrgag	11
	Abu Fatima	13
	Argo	35
	Dongola	4
	East Labab	30
	Gordote	31
	Means	20.7

	Dalgo	41
	Oshamato	29
Halfa	Sabo	29
	Saadeenkorta	35
	Abri	25
	Abu Sari	31
	Means	31.7
	ELgorar	22
Marawi	Tangasi	29
	Karima	28
	Means	26.3

Table 2. The occurrence of sooty canker disease of date palm trees in different Localities in Northern State of Sudan.

Locality	Disease incidence (%)	Disease severity (%)	No. field surveyed
ELdaba	21.3	18	15
Marawi	26.3	22	9
Dongola	20.7	16	12
Halfa	31.7	28	14
Means	25	22	Total=50

Table 3. Fungi and their distribution (%) isolated from naturally infected samples of date palm that exhibited typical symptoms of *N. mangiferae* frequency (%)

Fungi	Dongola	ELdaba	Marawi	Halfa	Mean
<i>Nattrassia mangiferae</i>	20.7	21.3	26.7	31.7	25
<i>Theilaviopsis paradoxa</i>	5	8	17	12	10.5
<i>Diplodia phoenicum.</i>	12	11	10	13	11.5
<i>Ceratocystis paradoxa</i>	10	3	5	7	6.25
<i>Fusarium spp.</i>	11	12	8	7	9.5
<i>Rhizoctonia spp.</i>	10	6	7	12	8.75

Table 4-A. Susceptibility of different date palm varieties to *N. mangiferae*.

Varieties	Jawa	Barakawi	Gundaila	Bentamoda	Meshregi
Susceptibility	-	++++	+++	++	+

- Resistant, +++++ High susceptibility, +++ Medium susceptibility, ++ Moderate susceptibility, + Low susceptibility.

Table 4-B. Disease incidence on other hosts in different areas in N.S.

Infection (%)

Area	Citrus	Ficus	Eucalyptus	Mango	Guava
Argo	33	-	-	18	10
Dongola	-	20	5	-	-
Tangasi	7.5	-	-	-	-
ELgaba	15.4	-	-	23	-
ELkarad	28	-	-	-	-

4. DISCUSSION

In Sudan sooty canker disease caused by *N. mangiferae* in date palm was reported by Ahmed and Yassin (1992), Baghdadi *et al.*, (2003), and Elshiekh (2004). Microscopic examination revealed the presence of the fungus *N. mangiferae* as the main causal agent of branch wilt, sooty canker and die-back of date palm and other orchard trees in Northern State of Sudan. The symptoms observed were similar to those mentioned in literature by several authors (Paxon *et al.*, 1964; Davison, 1972;; Pandey, *et al.*, 1981; Giha, 1996; Baghdadi *et al.*, 2003; Elshiekh, 2004). Its appearance on different trees in Sudan directly threatens the future of these plants. The survey of disease conducted in 2013 and 2014 has shown the severe damage in Northern State on date palm, mango and citrus trees .

The study suggests clearly that the fungus has potentials to cause significant damage upon a wide range of unrelated tree species. The survey confirmed the occurrence of the disease at an epidemic level in date palm and other fruit trees such as mango, citrus and guava in the Northern State. The existence of the fungus at an epidemic level makes a great threat to date palm trees. The frequency of infestation of date palm range between 20.7- 31.7% and in mango citrus, and guava, the range is between 5-22%.

The development and spread of *N. mangiferae* sooty canker disease have been a function of interaction among cultural practices, edaphic and climatic conditions.

Temperatures have been a factor in the frequency of infection in the Northern State Elshiekh (2004). Variation in the frequency of infection in the Northern State could be attributed to cultural practices, for instance the spacing between trees is very close in Halfa and Marawi, which might enhance the transmission of pathogen from one tree to another. Moreover, irrigation canals were in contact with date palm trunks, which facilitate the transmission of the fungus from soil by water; the spores of the fungus are easily transmitted by water from one tree to another. This is in agree with Giha (1975) and Nori (1996).

Various grades of symptoms were reported in the present study. They may be summarized as chlorosis, necrosis and yellowing of the leaves; black sooty canker on the basal part of the leaves, which led to partial or total wilt and mortality. These are typical of *N. mangiferae* symptoms (Giha, 1975; Baghdadi *et al.*, 2003, and Elshiekh, 2004). The described morphological characteristics of *N. mangiferae* were in agreement with (Ellis .,1976; Sigler *et al.*, 1997; Farr *et al.*, 2005; Crous1 *et al.*, 2006; Al-Saadoon *et al.*, 2012)

REFERENCES

- Abed–Elkarim, H.A.2004.Personal communication. Ministry of Agriculture River Nile State.
- Ahmed, M.Y. 2003. Date palm problems in Nile State. Paper submitted in Date Palm Workshop. Dec.2003, Sudan Univ. of Science and Technology, Khartoum, Sudan.
- Ahmed, N.A. and Yassin, A.M. 1992. *Technical Bulletin* No.5. Agric. Res. Corporation, Wad Medani, Sudan.
- Al-Saadoon, A.H., M.K.Ameen, M.A. Hameed, A. AlBadranand Ali Z. (2012). First report of grapevine dieback caused by *Lasiodiplodiatheobromae* and *Neoscytalidium dimidiatum* in Basrah, Southern Iraq. *African J. of Biotech.* 11(95): 16165-16171
- Baghdadi, A.M. Abulgasim, E.A. and Mokhtar, M.S. 2003. An epidemic wilt disease affects date palm trees in Northern Sudan. Paper presented in Date Palm Workshop.. Dec. 2003, Sudan Univ. of Science and Technology, Khartoum, Sudan.
- Billis, D. F. and Djerbi, M. 1983. Investigation on the causal of decline Disease in date palm. *Date Growers Institute Ann. Rept.* 11: 4-6.
- Burgess L.W., Knight T.E., Tesoriero L. and Phan H.T. 2008. Diagnostic

- Manual for plant diseases in Vietnam. ACIAR Monograph No. 129, 210 pp. ACIAR: Canberra.
- Calavan, E.C. and Wallace, J.M. 1954. *Hendersonula toruloidae* Nattrass on citrus in California. *Phytopathology*, 44: 635-639.
- Davison, A. D. 1972. Factor affecting development of madrone canker. *Plant disease Repr*, 56: 50-52.
- Elarosi, H., Elsaid; H. Nagiels, M.A; Jaheen, N. 1983. Proceedings of the First Symposium on Date Palm in Sudia Arabia, Edirors and Publishers, 19-83.
- Elliott, M. and Edmonds, R.L. (2004). Systematic study of *Natrassia mangiferae*, the cause of madrone canker. In: Proceedings of the 51st Western International Forest Disease Work Conference; August 18–22, 2003; B.W. Geils (ed.). pp 59-62.. Grants Pass, OR. Flagstaff, AZ: U.S. Department of Agriculture, Forest Service, RockyMountain Research Station.
- Ellis, M.B. 1976. More Dematicaceous Hyphomycetes, Commonwealth Mycological Institute Kew, Survey, England, 507 pp.
- Elshiekh, A.M.E. 2004. *Investigation on the Causal Agent of Sooty Canker Disease of Date Palm Trees in Northern State*. M.Sc. Thesis (Agric). Sudan University of Science and Technology, Sudan.
- Eltaher, and Khalifa, S.A. 2004. Anew disease in Acacia trees in Northern Kordofan. Akhbarelyom (daily news paper) April (2004 Saturday number 3422).
- Farr, D.F., M. Elliott, A.Y. Rossman, and R.L. Edmonds (2005). *Fusicoccumarbuti* sp. Nov. causing cankers on Pacific madrone in western North America with notes on *Fusicoccum dimidiatum*, the correct name for *Scytalidium dimidiatum* and *Natrassiamangiferae*. *Mycologia*, 97: 730–741
- Giha, O.H. 1975. *Hendersonula toruloidea* associated with serious wilt disease of shade trees (*Ficus benbhalensis*) in Sudan. *Plant Disease. Repr*. 59: 899-902.
- Giha, O.H. 1996. *Introduction to Principles of Plant Disease in Sudan*. Dar Elasala, Wad Medani, 200pp. (in Arabic)
- Mahadi, A.A. 2001. Sudan country study on biodiversity. Ministry of Touris and Environment, p.99.
- Mousiri, A., lamari, L. and Saboon, N. 2001. Inventory of fungi rhizosphere of

- susceptible and resistant palm to the bayoud in the region of Adrar (Algeria) Seventh Arab Congress of Plant Protection, 22-26 October, 2000, Amman, Jordan. (Abstract book)
- Nair, K. 2001. Pest outbreak in tropical forest plantations. Is a great risk for exotic species? Jakarta, Indonesia, Center for International Forestry Research (CIFOR).
- Nori, W.S. 1996. *Branch Wilt and Mortality of Some Shade Trees in Khartoum State Caused by Natrassia mangiferae*. M.Sc. (Agric). Thesis, University of Khartoum, Sudan.
- Ogawa, J.M. 1954. The occurrence of *Hendersonula toruloidea* Natrass on populous species in California. *Plant Dis. Repr.*, 38: 238.
- Osman, A. M. A. 1979. Date palm production in the Sudan. Agric. Res. Cor. Horticultural Research center. Edammer (Arabic), Report page 15.
- Pasha, A. A. (2007). Resistance of some wood to *Natrassiamangiferae* fungus which causes decomposition in Nineveh. PhD thesis. College of Agriculture and Forestry. University of Mosul / Iraq.
- Paxton, J.D.; Wilson, E.E., and Davis, J.R. 1964. Branch wilt disease of fig caused by *Hendersonula toruloidea*. *Plat Disease. Repr.*, 48: 142.
- Pandey, R.S., Bhargava, S. N. Shukla, D. N. and Khati, D. V. 1981. Anew Leaf disease of mango. *Plant Disease*, 65: 441-442.
- Phillips, A. J. L., Crous, P. W., & Alves, A. (2007). *Diplodia seriata*, the anamorph of "Botryosphaeria" obtusa. *Fungal Diversity*, 25, 141–155
- Purseglove, J.W. 1981. *Date Palm (Phoenix dactileferae L) Tropical crops (Monocotyledons)*. Huntsmen.offset printinapte, Ltd: 429-450.
- Rottan, S.S., and Al-Dboon, A.H. 1980. Note on fungi associated with date palm. *Sydowia*. 33: 246-264.
- Salih, A.A. 2003. Effect of soil and irrigation on the production of date palm. Paper submitted in Date Palm Workshop Institute, date and year..., Kew, U.K.
- Sigler, L., R.C. Summer bell, L. Poole, M. Wieden, D.A. Sutton, M.G. Rinaldi, M. Flguirre, G.W. Estes and J.N. Galgiani (1997). Invasive *Natrassiamangiferae* infections. Case report, literature review and therapeutic and taxonomic appraisal. *J. of Clinical Microb.* 35 (20): 433-440
- Sutton, B. C, and Dyko, B. J. 1989. Revision of *Hendersonula toruloidea*.

Mycological Research, 93: 466-488.

Waller JM, Lenne JM, Waller SJ, 2002. Plant Pathologist's Pocketbook. 3rd edn.

CABI Publishing, New York. pp. 27.

Wangikar P .D. Raut, J . G. and Gapalkrishna, N. 1975. Drying of grape Vines
caused by *Hendersonula toruloidea*. Indian phytopathology,
pp. 22, 403-104.

Wilson, E.E. 1949. The pycnidial stages of the walnut branch wilt fungus,
Exosporina fawcetti. *Phytopath.* 39: 340-346.

حدة وشدة الإصابة بمرض القرحة السخامية في نخيل التمر في الولاية الشمالية - السودان

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الملخص:

هذه الدراسة خاصة بإجراء مسح ميداني لمرض القرحة السخامية (ذبول الفروع) في نخيل التمر (Phoenix dactylifera L) في الولاية الشمالية من السودان والتعرف على المسبب لهذا المرض ومدى حدوثه ونسبة الإصابة وشدة الإصابة وأعراضه المرضية. بدأت الدراسة بإجراء مسح ميداني للمرض في موسم 2013-2014 م في محليات حلفا، دنقلا، الدبة ومروي. وقد شمل المسح الميداني حوالي ٥٠ مزرعة نخيل، وتم عزل المسبب الممرض والتعرف عليه بناءً على خصائصه المورفولوجية، وتظهر أعراض المرض في نخيل التمر باصفرار في قمة الأوراق يعقبه جفاف وموت الأوراق، ذبول الأشجار وموت الأطراف حتى تموت الشجرة بكامله، تتقرح الأجزاء المصابة وتظهر طبقة سوداء ناعمة من الجراثيم الفطرية المميزة لفطر النتراسيا. كانت نسبة حدوث مرض القرحة السخامية عالية في حلفا ومروي (٣١,٧ ، ٢٦,٣%) على التوالي ولكنها أقل في دنقلا والدبة (٢٠,٧ ، ٢١,٣%) على التوالي. بينما كانت نسبة الإصابة عالية في دلقو (٤١%)، ارقو (٣٥%)، الكر (٣٦%)، شرق لب (٣٠%). كانت نسبة الإصابة بالمرض في جميع المناطق التي تم مسحها مرتفعة وتتراوح بين ٤١-٢٠% مع شدة المرض بين ٢٨ - ١٦% وكان معدل الإصابة في نخيل التمر مرتفعاً حيث بلغ ٢٥% مقارنة بالأشجار الأخرى مثل المانجو والموايح واللبخ والتي بلغت ١٣,٥%. تم عزل الفطر *Nattrassia mangiferae* والتعرف عليه من جميع العينات المصابة من النخيل كمسبب لمرض ذبول وتقرح وجفاف القلف في النخيل وموت الفسائل وهو الفطر السائد المعزول في معظم العينات حيث بلغت نسبتة ٢٥% بينما الفطريات الأخرى مثل *Diplodia phonicum* (١١%) و *Thielaviopsis paradoxa* (10%).

الكلمات المفتاحية: نخيل (*Phoenix dactylifera*)، الفطر الممرض، التمر، القرحة السخامية والفطر المسبب للمرض

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