In Vitro Efficacy of Some Plant Extracts Against Sooty Canker Disease of Date Palm

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Abstract

Plant diseases control represents a major challenge that farmers are facing in the management of cropping systems. *Nattrassia mangiferaeis* a fungal pathogen causing sooty canker disease on date palm which is an important disease of date palm In the Northern State of the Sudan causing severe damage of off-shoots, date palm trees and reduction in yield. In present study, the pathogenic fungus was isolated from infected plant parts and identified based on morphological and cultural characters as *Nattrassia mangiferae* .The in vitro efficacy of different plant extracts Neem (*Azadirachta indica*), Mint (*Menthaspicata*), Ryhan (*Ocimum basilicum*), and Maharab (*Cymbopogon schoenanthus* Poximus).were tested to control sooty canker pathogen. Different concentrations 5, 10, 15 and 20% of plant extracts were tested for their effect on the inhibition of mycialial germination of the fungus. All the plant extracts showed significant inhibition of fungal mycelial growth of *Nattrassia mangiferae.* Among the different conc. extracts, complete inhibition of fungal mycelial growth was exhibited at 20% of *Ocimum basilicum* which was found the most effective followed by Mint (*Menthaspicata*) with only retardation of mycelial growth while, Neem (*Azadirachta indica*), and Maharab (*Cymbopogon schoenanthus* Poximus was the least effective. Four chemical fungicides namely, Tilt, Benlate, Bayfidan, and Bayliton, at different conc. (10 ppm, 20 ppm, 30 ppm, 40 ppm and 50 ppm) were also used for their effect on the mycialial germination of *Nattrassia mangiferae*, all of them inhibited the germination the most effective one was Tilt at 30-50 ppm, followed by Benlate while Bayleton and Bayfidan at high concentration 50 ppm inhibited the growth of the fungus. Application of plant extract which are easily available for controlling plant diseases which are non-pollutive, cost effective nonhazardous and do not disturb ecological balance. Investigations are in progress to test the bio efficacy of these extracts in field applications. The effect of plant extract is more effective for controlling the fungus as compare to the fungicides

Key words: Date palm, sooty canker, fungicides, *Nattrassia mangiferae*, Plant extract

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Introduction

Sooty canker disease observed in date palm in Sudan during a survey undertaken by (Ahmed and Yassian, 1992). The fungus *N. mangiferae* was identified to be the causal organism of the sooty canker of date palm which was reported by (Bagdadi *et al*., 2003). The symptoms of sooty canker disease caused by *N. mangiferae* on date palm observed by Elshiekh (2004) 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 arthrosporous. Black colour and destruction of conductive system. The 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.The sooty canker disease of date palm caused losses of yield (30-60 %), as well as high loss of mature trees and off-shoot in the main growing areas in the Northern state (Elsheikh, 2004). *N. mangiferae* is considered relatively weak pathogen; were hot, dry, weather favors the disease development. It caused death of madrone trees unless coupled with severe drought condition or other causes such as water stress, pathogen or insect (Elliott, 2000). Disease can be prevented by maintaining tree vigor and avoiding unnecessary pruning or wounding. As the sunburned bark is the most common place that the fungus enters, careful pruning techniques should be used so that limbs that shade the trunk and scaffold branches are not removed. When infections are found in the upper branches remove infected limb by cutting at least six inches below infection site. Treatment of wounds with pruning paint or chemical compounds is recommended. Severe pruning of large branches and limbs of trees susceptible to sooty canker should be avoided. White wash applied to exposed lower trunk area, will reduced the possibility of infection; these materials reflects radiation and reduce bark temperature (Oslen, 1998). Different amount of plant extracts or essential oil were applied to inhibit the growth of different fungi. Extracts of *Cymbopogon citrales* controlled the mycelium growth of Fusarium, Sclerotinia, and *Rhizoctonia spp*. (Shenoi *et al*., 1998) tested leaf extracts of 45 plant as antifungal agents against *Alternaria alternata* on tobacco *in vitro* studies. Extract from garlic followed by Henna (*lowsonia inermis*) leaf extract was reported to control minimum mycelial growth of *Pythium aphanidermatum* (Shenoi *et al*. , 1998). Leaf extract of Neem recorded to minimize mycelium growth of the fungus .Neem (*Azadirachta indica*) against *Fusarium oxysporum, F. sp.* ciceri (Singh *et al*., 1980), and *Mentha spicata* against *Fusarium oxysporum F. sp*. lentis (Singh*et al*., 1994). ElKorashy (1997) reported that the plant extract of *Mentha spicata* (Mint) at concentration of 50 and 100 % inhibited the growth of *Rhizoctonia solani* , *Fusarium solani*, and *Sclerotium rolfsii*, which cause damping–off disease of peanut .Yegen *et al*., (1992), studied the effect of aqueous extract and essential oil of *Mentha spicata* and 5 other plant extract against *Rhizoctonia solani*, *Sclerotia sclerotium*, *Fusarium moniliforme*, and *Phytophothora capsici* . Among the plant extracts tested the essential oils of *Menthas picata* had lowest inhibitory effect against the mycelial growth. The antifungal activities of plant extracts increased as their concentration was increased. Some control of *N. mangiferae* was obtained by spraying with combination of insecticides Monocrotophos 0.20 % and the fungicide Bavistin 0.1% (Harsh *et al*., 1992). Two chemicals used to study the effect of growth of the fungus *N. mangiferae* isolated from date palm in *vitro* were Tilt and Nimrod. Tilt has completely inhibited the fungus at the highest concentrations of 200 and 100ppm (Elsheikh, 2004). The ability of four fungicides as control agent on the growth of mycelia of *Charala paradoxa*, was studied *in vitro* experiment, Bavistin was the most effective fungicide inhibited mycelial growth, followed by Benlate. The aim of these experiments was to study the antifungal activities of plant extract on the growth of *N. mangiferae in vitro* as compare to the chemicals fungicides for controlling the fungus causing sooty canker disease on date palm.

Materials and methods

The aim of this experiment was to study the antifungal activities of plant extract on the growth of *N. mangiferae in vitro* compare to chemical control. Four plant extracts were tested for their effect on the fungus .The plant extracts tested were Neem (*Azadirachta indica*), Mint (*Mentha spicata*), Rihan (*Ocimum basilicum*), and Maharab (*Cymbopogons choenanthus* Poximus). 100gram of each plant shoot were ground to fine powder and extracted twice with 90% aq ethanol, the alcohol was evaporated under vacuum and the

remaining extract were weighted and kept in the refrigerator at 10 ºC until used. At time of the experiment, a stock solution of each extract was brought to 100 ml with sterilized distilled water, and then one ml of each solution was brought to 100 ml sterilized water to give 1000 ppm. From this solution 0.5, 1, 1.5, and 2ml completed to 100ml by adding required amount of sterilized PDA medium in 250 ml conical flask to give a final concentration of 5, 10, 15, and 20ppm for each extracts. The content of each flask was poured in sterilized Petri-dishes and left to solidify and other plates with PDA medium served as control. Two diameters were drawn at the back of each Petri-dish for centering the inoculums. Five mm Disc was cut from the edge of 7days old culture of the fungus *N. mangiferae* and placed at the center of Petri-dishes were then incubated at room temperature (25-30º C) and the growth of the fungus was calculated every day.

The effect of each extracts was evaluated as percentage of reduction in colony diameter (R) where:-

$$R = \frac{dc - dt}{dc} \times 100$$

Where R = Percentage reduction of the growth, dc= diameter of control colony and dt= diameter of treatment colony. Four chemicals were tested for their effect on growth of the fungus *N.mangiferae*. The fungicides tested were Tilt, Benlate, Bayfidan, and Bayliton, Five dilutions of each product were used, one gram of each fungicide was added to one liter of sterilized distilled water to give 1000ppm. From this solution 1, 2, 3, 4, and 5ml were completed to 100ml by adding required amount of sterilized PDA medium in 250ml conical flask to give a final concentration of 10, 20, 30, 40, and 50 ppm for each chemical. The content of each flask was poured in sterilized 3 Petri-dishes and left to solidify; 3 plates poured with PDA medium served as control. Two diameters were drawn at the back of each Petri-dish for centering the inoculums. Then 5mm disc was cut from edge of 7days old culture of the fungus and placed into each Petri-dish for all concentration, the Petri-dishes were then incubated at room temperature (25-30 ºC) and the growth of the fungus was calculated every day. Further dilutions of concentration were used in the same manner as it will be mentioned in its appropriate place.

The effect of each chemical was evaluated as percentage reduction in colony diameter (R) where:-

$$R = \frac{dc - dt}{dc} \times 100$$

Where R = Percentage reduction of the growth, dc= diameter of control colony and dt= diameter of treated colony. The mean radius of *N. mangiferae* colonies was measured daily as two readings diameters (average), and the effect of each fungus was evaluated as percentage of growth reduction.

Statistical analysis

Statistical analysis of experimental data was done using the statistical software package M stat and SPSS stat. All comparisons were first subjected to one way ANOVA and significant to difference between treatments means were determined using Duncan's multiple range test (Duncan's, 1955).

Results and discussion

Four plant extracts were used in this study to evaluate effects of plant extracts on the growth of *N. mangiferae in vitro*, results showed the effect of Neem extract, Mint, Basal (Ryhan), and Maharab extracts on the linear growth of the fungus. After 4 days from inoculation the result indicated that Neem extract (Table 1), reduced the fungal growth at lower concentration 5, 10,15ppm whereas at 20ppm it has inhibited the growth. In case of Mint extract (Table 2) the growth was inhibited even at lowers concentration 5, 10, 15ppm while athigher concentration 20ppm the growth was reduced Ryhan extract (Table 3) inhibited the growth of the fungus at lower concentration 5, 10ppm whereas at 15, 20 ppm it has completely inhibited the growth (Fig 1), while Maharab extract (Table 4) reduced the fungal growth at lower concentration 5, 10ppm, while at 20 ppm the growth was inhibited. Four chemicals were used to study the effect of fungicides on linear growth of *N. mangiferaein vitro*. Showed the effect of Benlate, Tilt, Bayleton, and Bayfidan on the fungus linear growth. After 5days from inoculation the result indicated that Benlate (Table 5) reduced the fungus growth at lower concentration (20, 30ppm) whereas at 40,50ppm the growth was completely inhibited .In case of Tilt (Table 6) the growth was inhibited even at lower concentrations (10 ppm), and at higher concentration (50 ppm) it was completely inhibited up to 3days (Fig 1&2). Bayleton reduced the growth of the fungus at lower concentration at 10, 20 ppm whereas at 50ppm it has inhibited the growth after 5 days (Table 7). Bayfidan reduced the growth of the fungus at lower concentration 10and 20ppm whereas at 30, 40ppm inhibited the growth while at 50ppm the growth was completely inhibited (Table 8). The effect of plant extracts Neem, Mint, Maharaib, and Ryhan were demonstrated experimentally *in vitro*. The results obtained that showed Ryhan at lower concentration 5and 10 ppm reduced the growth of the fungus and at higher concentration completely inhibited the growth of the fungus. Ryhan was found to be effective in controlling *N.mangiferae*. Mint at lower concentration reduced the growth of the fungus and at higher concentration inhibited the growth of the fungus. This in agree with El korashy (1997) who reported that the plant extract of *Mentha apicata* at concentration 50 and 100% inhibited the growth of *Rhizoctonia solani* Maharaib and Neem at higher concentration reduced the growth of the fungus. The effect of fungicides Benlate, Tilt, Bayleton, Bayfedan, was demonstrated

experimentally *in vitro*. The result obtained showed that Benlate at lower concentration 10, 20 ppm reduced the growth of the fungus and at higher concentration 40&50 ppm inhibited growth completely, therefore Benlate was found to be effective in controlling N. *mangiferae*. Tilt at lower concentration reduced the growth of the fungus and at higher concentration completely inhibited the growth of the fungus. Tilt was found to be more effective in controlling *N. mangiferae*; the result is line with Elshiekh (2004) which reported Tilt has completely inhibited the fungus at the highest con. Bayleton at lower concentration reduced the growth of the fungus and at higher concentration inhibited the growth. Bayfedan at lower concentration reduced the growth of the fungus and at higher concentration (50 ppm) completely inhibited the growth. This coincides with the result those reported by several .Bayfedon was found to be more effective than Bayleton in controlling *N. mangifera.*

Table (1): Effect of Neem Extract on linear growth of *N.mangiferae (in vitro*). Colony diameter in cm

Time days	Means colony diameter					Reduction of Growth (%)			
	control	5 ppm	10 ppm	15 ppm	20 ppm	5 ppm	10 ppm	15 ppm	20 ppm
1st	1.15	0.3^{a}	0.15^{d}	0.13^{b}	0.08^{d}	73.91	86.96	88.69	93.04
2nd	3.5	1.73^{a}	1.23^{a}	1.1^{c}	0.83^{b}	50.71	65	68.57	76.43
3rd	7.35	5.9^{a}	5^{a}	4.5^{b}	3.88^{c}	19.73	31.97	38.78	47.28
4th	8.48	6.1^{a}	5.38^{a}	5^{a}	3.88^{b}	28.02	36.58	41.00	24.25
Means	5.09a	3.53b	2.96c	2.8c	2.21e				

Means in the same row with the same letters are not significantly different at P< 0.05 of probability according to Duncan's Multiple Range Test (DMRT). %5 LSD =0.363, C.V = 13.2

Data average of three replicates

$$R = \frac{A - B}{A} \times 100$$

R= Percent reduction of linear growth A= Linear growth of Control B = Linear growth of Treatment

Table (2): Effect of Mint Extract on linear growth of *N. mangiferae* (*in vitro*) colony diameter in cm.

Time days	Means colony diameter					Reduction of Growth (%)			
	control	5 ppm	10 ppm	15 ppm	20 ppm	5 ppm	10 ppm	15 ppm	20 ppm
1st	1.1	0.28^{b}	0.2^{c}	0.15^{a}	0.75^{d}	75	81.82	86.36	91.81
2nd	3.33	1.2^{a}	1^{a}	0.88^{c}	0.55^{b}	63.91	69.92	73.68	83.46
3rd	5.6	3.13^{a}	2.03^{a}	1.7^{b}	1.48^{c}	44.19	64.84	69.64	74.66
4th	8.4	4.25^{a}	2.95^{b}	2.28^{c}	2.18^{d}	49.40	63.88	72.92	73.11
Means	4.59a	2.23b	1.50c	1.28c	1.11c				

Means in the same row with the same letters are not significantly different at P < 0.05 of probability according to the Duncan's Multiple Range Test (DMRT). %5 LSD =0.293, C.V = 16.6

Data average of three replicates

$$R = \frac{A - B}{A} \times 100$$

R= Percent reduction of linear growth A= Linear growth of Control B = Linear growth of Treatment

Table (3): Effect of Basal (Ryhan) Extract on linear growth of *N. mangiferae (in vitro)* colony diameter in cm.

Time days	Means colony diameter					Reduction of Growth (%)			
	control	5 ppm	10 ppm	15 ppm	20 ppm	5 ppm	10 ppm	15 ppm	20 ppm
1st	1.13	0.45[a]	0.33[a]	0.2[b]	0.13[c]	60	71.11	82.22	88.89
2nd	3.5	1.95[a]	1.78[a]	1.43[a]	1.35[b]	44.28	49.29	59.29	61.43
3rd	6.68	4.25[a]	3.9[a]	3.5[a]	3.1[b]	36.33	41.57	47.57	53.56
4th	8.5	5.38[a]	3.9[b]	4.5[d]	3.63[c]	36.764	54.12	47.06	57.35
means	4.93a	3.04b	2.7c	2.5d	2.05e				

Means in the same row with the same letters are not significantly different at P < 0.05 of probability according to the Duncan's Multiple Range Test (DMRT). %5 LSD =0.177, C.V = 13.6

Data average of three replicates

$$R = \frac{A - B}{A} \times 100$$

R= Percent reduction of linear growth A= Linear growth of Control B = Linear growth of Treatment

Table (4): Effect of Maharaib Extract on linear growth of *N.mangiferae* (*in vitro*) colony diameter in cm.

Time days	Means colony diameter					Reduction of Growth (%)			
	control	5 ppm	10 ppm	15 ppm	20 ppm	5 ppm	10 ppm	15 ppm	20 ppm
1st	1.05	0.38[a]	0.33[a]	0.2[b]	0.13[d]	64.26	69.05	80.95	88.10
2nd	3.75	1.33[a]	0.85[a]	0.4[b]	0.3[d]	64.67	77.33	89.33	92
3rd	6.75	1.88[a]	1.3[a]	0.55[b]	0.4[c]	72.22	80.74	91.85	94.07
4th	8.1	1.88[a]	1.33[a]	0.65[b]	0.5[d]	76.85	83.64	91.98	93.83
Means	4.87a	1.35b	0.84c	0.49d	0.32d				

Means in the same row with the same letters are not significantly different at P< 0.05 of probability according to the Duncan's Multiple Range Test (DMRT). %5 LSD =0.304, C.V=12.1

Data average of three replicates

$$R = \frac{A - B}{A} \times 100$$

R= Percent reduction of linear growth A= Linear growth of Control B = Linear growth of Treatment

Table (5): Effects of Benlate on linear growth of *N. mangiferae* (*in vitro*).Colony diameter in cm.

Time days	Means colony diameter						Reduction of Growth (%)				
	control	10 ppm	20 ppm	30 ppm	40 ppm	50 ppm	10 ppm	20 ppm	30 ppm	40 ppm	50 ppm
1st	1	0.167[a]	0.12[a]	0.11[a]	0[b]	0[c]	83.3	88	89	100	100
2nd	1.6	0.3[a]	0.2[a]	0.133[a]	0[c]	0[b]	81.25	87.5	91.68	100	100
3rd	3.5	1.2[a]	0.5[a]	0.37[a]	0.2[b]	0.07[c]	65.71	85.71	89.42	94.28	98
4th	5.4	2.1[a]	0.8[a]	0.47[b]	1.57[a]	0.2[c]	61.11	85.19	91.29	70.92	96.29
5th	6.8	3.1[a]	1.2[a]	0.8[a]	0.53[b]	0.27[c]	54.41	82.35	88.23	92.20	96.02
6th	7.7	4.17[a]	1.83[a]	1.13[a]	0.6[b]	0.33[c]	45.84	76.23	85.32	92.20	95.71
7th	8.45	4.5[a]	1.8[a]	0.97[b]	0.7[d]	0.47[c]	46.74	78.69	88.52	91.71	94.44
Means	4.9a	2.21b	0.92c	0.75d	0.52d	0.19e					

Means in the same rows with the same letters are not significantly different at P< 0.05 of probability according to the Duncan's Multiple Range Test (DMRT)**.** %5 LSD =0.225, C.V = 23.6

Data average of three replicates

$$R = \frac{A - B}{A} \times 100$$

R= Percent reduction of linear growth A= Linear growth of Control B = Linear growth of Treatment

Table (6): Effect of Tilt on linear growth of *N. mangiferae* (*in vitro*) colony diameter in cm.

Time days	Means colony diameter						Reduction of Growth (%)				
	control	10 ppm	20 ppm	30 ppm	40 ppm	50 ppm	10 ppm	20 ppm	30 ppm	40 ppm	50 ppm
1st	1.1	0[a]	0[a]	0[a]	0[a]	0[a]	100	100	100	100	100
2nd	1.7	0[a]	0[a]	0[a]	0[a]	0[a]	100	100	100	100	100
3rd	3.2	0.4[a]	0.2[a]	0.1[b]	0.1[c]	0[a]	87.5	93.75	96.87	96.87	100
4th	5.3	0.53[a]	0.33[a]	0.23[a]	0.2[a]	0.13[b]	90	93.77	95.66	96.22	97.54
5th	6.67	0.73[a]	0.5[a]	0.4[a]	0.3[a]	0.13[b]	89.05	92.50	94.00	95.50	97.05
6th	7.4	1[a]	0.57[a]	0.43[a]	0.33[b]	0.2[c]	86.48	92.29	94.18	95.54	97.29
7th	8.47	1.08[a]	0.63[a]	0.5[a]	0.37[b]	0.2[c]	87.24	92.56	94.09	95.63	97.63
Means	4.83a	0.53b	0.32b	0.24b	0.18b	0.12b					

Means in the same row with the same letters are not significantly different at P < 0.05 of probability according to the Duncan's Multiple Range Test (DMRT). %5 LSD =0.786, C.V = 12.4

Data average of three replicates

$$R = \frac{A - B}{A} \times 100$$

R= Percent reduction of linear growth A= Linear growth of Control B = Linear growth of Treatment

Table (7): Effect of Bayleton on linear growth of *N. mangiferae* (in vitro). colony diameter in cm.

Time days	Means colony diameter						Reduction of Growth (%)				
	control	10 ppm	20 ppm	30 ppm	40 ppm	50 ppm	10 ppm	20 ppm	30 ppm	40 ppm	50 ppm
1st	1.1	0.5[a]	0.37[b]	0.23[c]	0.1[d]	0[e]	54.54	66.36	79.10	90.90	100
2nd	3.8	2.07[a]	1.4[a]	1.33[a]	0.67[b]	0.2[c]	45.52	63.15	65	82.36	94.73
3rd	6.33	2.83[a]	2.17[a]	1.83[a]	1.67[a]	1.07[c]	55.29	65.71	71.09	73.61	83.09
4th	7.3	3[a]	2.33[a]	2[a]	1.83[b]	1.23[c]	58.90	68.08	72.60	74.93	83.15
5th	8.43	3.5[a]	2.8[a]	2[b]	1.7[c]	1.37[e]	58.48	66.78	76.28	79.83	83.74
Means	5.4a	2.38b	1.81c	1.48d	1.19e	0.77ea					

Means in the same rows with the same letters are not significantly different at P < 0.05 of probability according to the Duncan's Multiple Range Test (DMRT). %5 LSD =0.212, C.V = 13.4

Data average of three replicates

$$R = \frac{A - B}{A} \; x\,100$$

R= Percent reduction of linear growth A= Linear growth of Control B = Linear growth of Treatment

Table (8): Effects of Bayfidan on linear growth of *N.mangiferae* (*in vitro*).colony diameter in cm.

Time days	Means colony diameter						Reduction of Growth (%)				
	control	10 ppm	20 ppm	30 ppm	40 ppm	50 ppm	10 ppm	20 ppm	30 ppm	40 ppm	50 ppm
1st	1.03	0.1[b]	0[d]	0.02[a]	0[c]	0[e]	90.29	100	98.05	100	100
2nd	3.5	3.4[a]	0.3[b]	0.17[c]	0.1[d]	0.07[e]	85	91.42	95.14	97.14	98
3rd	5.77	2.17[a]	0.5[c]	0.37[e]	0.3[d]	0.2[b]	62.39	91.33	93.58	94.80	96.53
4th	7.33	3[a]	0.9[e]	0.6[c]	0.5[d]	0.3[b]	59.07	87.72	91.81	93.17	95.90
5th	8.47	3.67[a]	2.63[a]	2.03[a]	1.87[b]	0.67[d]	56.67	68.94	76.03	77.92	92.08
Means	5.22a	2.46b	0.87c	0.64c	0.55c	0.25c					

Means in the same row with the same letters are not significantly different at P < 0.05 of probability according to Duncan's Multiple Range Test (DMRT). %5 LSD =0.546, C.V = 44.9

Data average of three replicates

$$R = \frac{A - B}{A} \; x\,100$$

R= Percent reduction of linear growth A= Linear growth of Control B = Linear growth of Treatment

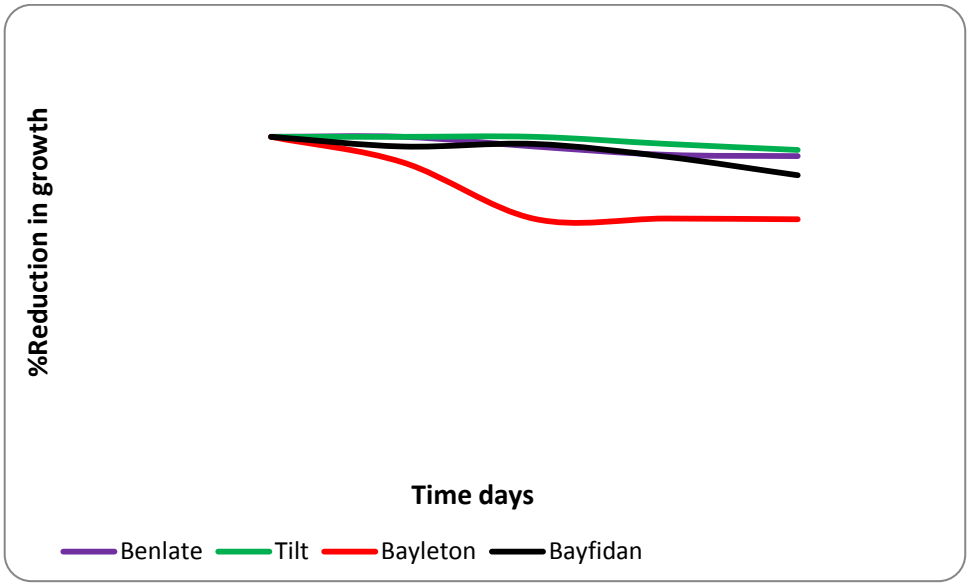

Fig (1): Effect of different Fungicides (at conc. 50ppm) on linear growth of *N. mangiferae*

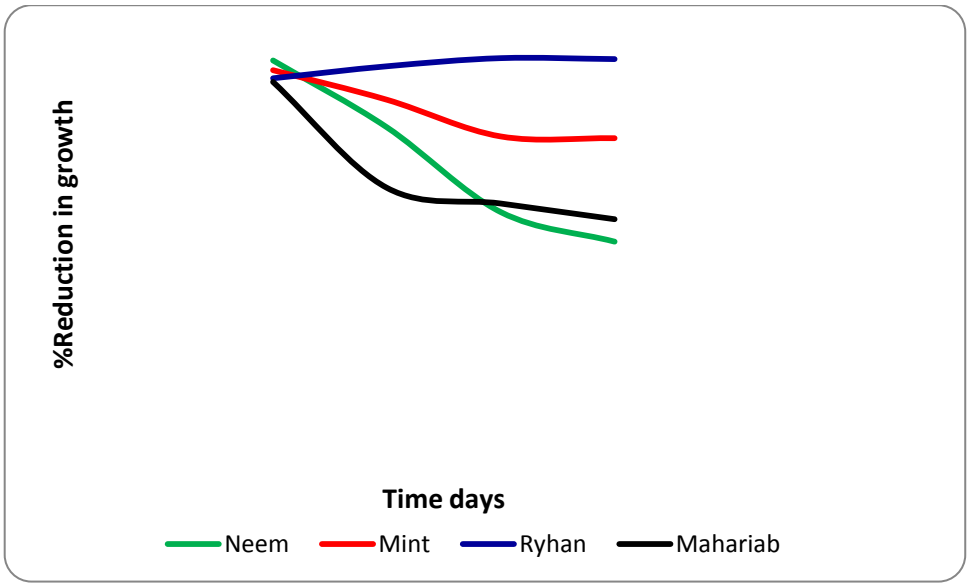

Fig (2): Effect of different plant extract (at conc. 20ppm) on linear growth of *N. mangifera*e

Conclusion

Nattrassia mangiferaeis a fungal pathogen causing sooty canker disease on date palm. The present work has revealed the in vitro efficacy of different plant extracts Neem, Mint, Ryhan and Maharab. All the plant extracts showed significant inhibition of fungal mycelial growth of Nattrassia mangiferae. Among the different conc. extracts, complete inhibition of fungal mycelial growth was exhibited at 20% of Ocimum basilicum which was found the most effective. Four chemical fungicides namely, Tilt, Benlate, Bayfidan, and Bayliton, at different conc. (10 ppm, 20 ppm, 30 ppm, 40 ppm and 50 ppm) all of them inhibited the germination the most effective one was Tilt at 30-50 ppm, followed by Benlate while Bayleton and Bayfidan at high concentration 50 ppm inhibited the growth of the fungus.

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تاثير بعض المستخلصات النباتية علي مرض القرحة السخامية في نخيل التمر معمليًا

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الملخص العربي

مكافحة أمراض النبات تمثل تحديًا كبيرًا يواجهه المزارعون في إدارة نظم زراعة المحاصيل. الفطر *Nattrassia mangiferae* هو الفطر المسبب لمرض القرحة السخامية في النخيل وهو الامراض الهامة في النخيل في الولاية الشمالية في السودان و الذي ادي موت الكثير من شتول واشجارالنخيل و قلة الانتاجية. في الدراسة تم عزل الفطر المسبب للمرض القرحة السخامية من أجزاء النباتات المصابة وتم التعرف عليها بناءً على الخصائص المورفولوجية والمزرعية للجراثيم الفطرية . تم دراسة تاثير بعض المستخلصات النباتية معمليا في مكافحة الفطر *Nattrassia mangiferae* المسبب لمرض القرحة السخامية في نخيل التمر مثل النيم (*Azadirachta indica*) والنعناع (*Mentha spicata*) و الريحان (*Ocimumbasilicum*) والمحريب (*Cymbopogonschoen*)). اختبرت بتراكيز مختلفة (٥ ٪، ١٠٪، ١٥٪ و ٢٠٪) من المستخلصات النباتية لتأثيرها على تثبيط الإنبات والنمو الفطري للفطر*Natrassia mangiferae*. أظهرت جميع المستخلصات النباتية تثبيط معنوي لنمو الفطرالمسبب للمرض .من بين جميع المستخلصات كان مستخلص الريحان افضل المستخلصات المستعملة (*Ocimumbasilicum*) ادي الي تثبيط كامل لنمو الفطر عند التركيز ٢٠٪ الذي وجد أنه الأكثر فاعلية يليه النعناع (*Mentha spicata*). الا ان المحريب والنيم قللا من نمو الجراثيم الفطرية (*Azadirachtaindica*) و(*Cymbopogonschoen*)). وهما الأقل فاعليةا. تم اختبار تاثير اربعة من المبيدات الفطرية وهي Tilt و Benlate و Bayfidan و Bayliton بتركيزات مختلفة (١٠، ٢٠، ٣٠، ٤٠، ٥٠ جزء في المليون) لتأثيرها على الإنبات والنمو الفطري للفطر *Natrassia mangiferae*، كل المبيدات كان لها تاثير مثبط لنمو وانبات الجراثيم للفطر وكان اكثر المبيدات المستخدمة فعالية ولة تاثير مثبط هو مبيد التليت Tilt عند (التركيز ٣٠، ٥٠ جزء في المليون) يلية البنليت Benlate يلية Bayfidan ثم Bayliton علي الترتيب حسب التركيزات الموصي بها وكان الأخيرين ثبطا نمو الفطر عند تركيز ٥٠ جزء في المليون. استخدام المستخلصات النباتية متاح بسهولة لمكافحة الامراض النباتية النبات وهو امن وفعال وقليل التكلفة و الخطورة وغير ضار في التوازن البيئي. التجارب جارية لاختبار الفعالية الحيوية لهذه المستخلصات في التطبيقات الميدانية والحقلية ، ادي تاثير المستخلصات النباتية فعالية كبيرة في مكافحة الفطر مقارنة بالمبيدات الفطرية.

الكلمات الدالة: نخيل التمر ، مبيدات فطرية ، مستخلص نبات، القرحة السخامية