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Effect of *Mentha piperita* mint water extracts in inhibiting the growth of some pathogenic fungi

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Abstract :

The aim of the study was to study the effect of the mineral extract of Munthapiperita in the growth of fungus *Rhizoctoniasolani*, *Aspergillusniger*, *Aspergillusterreus* , *Fusariumoxysporum*, *Fusariumoxysporumf. sp*. (100%) , 25%, 50%, 75% and 100%. The results showed the efficacy of the mint extract of the mint plant in inhibiting the growth of fungi and was the highest inhibition when using 100% concentration. Especially after 3,2.1 days of growth. We did not notice that solaniRhizoctonia was affected by the extract, especially after the incubation period of 7,6,5,4 days.

Introduction

Minta Piperita is a perennial herbaceous plant up to 80 cm long and has a square stalk with a strong aromatic aroma, purple violet flowers, the used part of the plant mint and the pilot oil. the original homeland for mint is Europe and Asia and south America. There are several types of mint. The mint contains essential oil, the most important components of which are methanolamine. It also contains flavonoids, the most important of which are luteolominescid. It also contains phenolic acids and also contains triglycerides. Peppermint is widely used. Mint leaf leaves were found in Egyptian pyramids dating back to about 1000 BC and were of high value to the Greeks and Romans. Each 100 g of mint, according to the US Department of Agriculture, contains the following dietary information: Calories 70, Fat 0.94 , Saturated fats: 0.24, carbohydrates 14.89, fiber 8, proteins 3.75 and the nutritional value of mint plant containing minerals such as Fe, Cu, Mg, Na and K and vitamins A and C and riboflavin and amino acids, especially tryptophan and fatty acids and fibers and tannins.

The genus Mintha belongs to the oral family of 5000-2000 species. Most of these species produce volatile oils in turbines. The genus Mintha is one of the most important species. This species has 30 to 25 species and the importance of its species varies between commercial and medical, and most of its species reproduce vegetatively through the formation of Stolons, as well as through Sucker cancers. (Gershezon et al., 2000).

Mint is a perennial plant characterized by a square-shaped square-shaped square-shaped veneer with different shapes and sizes of taxonomic importance. The peppermint mint grows 90 to 30 cm long. Either its leaves are dark green color up to a length of 9 - 4 cm and a width of 4.0 - 1.5 cm. Either the edge of the paper is unevenly serrated and its peak sharp (writer, 1988).

This species is a hybrid of M. aquatic and mint spicata and its flowers produce sterile seeds, so its propagation is not possible. England is home to the Linus Encyclopedia (Tucker and Chambers, 2002)

Peppermint, Spearmint and Cornmint are the most important because of their high production of Oudhia (2003). The type M. piperita is characterized by its high concentration of menthol and Menthone and is the best pink mint in carvone production (Bahl et al., 2000).

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As the volatile oils are formed within a chemically complex metabolic system. The bio-pathway of formation produces monoclonal terpenes, often methanol, methanol, methanol, methanol and silicon. The plant species is more important as it produces more than 45% of methanol (Mahmoud and Croteau, 2001)

The mint is grown in large areas of the United States of America, India, China, Italy, France, Bulgaria, Russia and Henkaria for its important industrial role and material resurgence (Lawrence, 1985). China's oil production reached 1,700 tons per year and in America it was 3,000 tons in 1984. India ranks first in production and cultivated land, with 8,500 tons of production in 2003, and 10% of its cultivated land is grown with mint. Mint cultivation occupies an area of 490000 ha in America for 2003. (Aflatun, 2005). Evans (1999) estimates the proportion of the world's oil produced by volatile oils in 1987, and the volatile oils produced from mint 45%, lemon oil 22%, eucalyptus oil 12% and clove oil 11%.

The production of some countries of Menthol in 1987 (Vaze, 2004)

There are many vital activities of peppermint oil among which many researchers have analgesic analgesic and anesthetic anesthetic and anesthetizing an allergenic, antimetic, anticompetitive, antipyretic, anticoagatic, bronchodilator, asodilatator, stimulant, carminative and diuretic diuretic against antiitch itch and benefits against antiulcer ulcer, dilaphoretic congestion, tonic tonic, insomnia insomnia and dizziness dizziness, migraine migraine migraine debility, vertigo vertigo. Laryngitis and Irritable Bowel Syndrome (IBS) (Duke et al., 2002).

It has been noticed that the mint oil pilot affects the fungal pathogens such as Geotrichumcandidum, Candida albicans and Helminthosporium and there are many fungi have been affected by the effectiveness of oil such as Pythium, Aspergillus, Penicillium, Fusarium, Peciulyte 2001 (Motiej

It has been used as insecticide Insecticidal and proved effective against fleas, fly home and fly disease sleeping and flour beetles and the next bug and the mosquito mosquito and the impact of oil in the eggs and larvae of domestic flies Ovicidal, LarvicidalPathak et al., 2000). It was found that the skin coated with peppermint oil avoids mosquitoes approaching, giving a higher expelling force than the commercial chemical, biotoyl phthalate. Peppermint oil also acts as a pesticide against some Miticidal and some nematicidal species (Perrucci et al. 1995).

The oil has been shown to be effective against many positive and negative Kram bacteria. As it has proved effective against diphtheria bacteria, and staphylococci such as Staphylococcus. aureus, and swimming pools such as Streptococcus haemolyticus and Proteusvulgaris. And the bacteria causing the pneumonia Klebsiellapneumonia. The effect of peppermint oil has been observed in pathogenic intestinal bacteria such as the cause of typhoid or food poisoning Salmonella and cause of dysentery Shigellaflexneri or cause cholera (VibriocholeraReichling et al., 1999). It has been noted that the oil of spearmint mint has an effect on fungal pathogens such as Geotrichumcandidum, Candidaalbicans and Helminthosporium. Many fungi have been affected by oil efficiency such as Pythium, Aspergillus, Penicillium, Fusarium and Peciulyte, 2001 (Motiej

The study of Mikus et al. (2000) is evidence of the effect of oil on the eradication of parasites causing the disease of Baghdad Leishmania.

The economic importance of Mentha comes from the production of volatile oil with economic benefits, as these oils are the main source of menthol, as the menthol formula formula C10H20O and a partial weight (156.27) Mall (Aflatuni, 2005) is a phenolic compound of secondary metabolites classified as monovalent turbines It is boiling at 212 ° C and can be

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obtained from the pilot oil when it is cooled to -40 ° C. Menthol is transformed into a crystalline form. Menthol is made up of complex reactions. Carbohydrates are the originals because they are the result of photosynthesis and when these substances enter the glycolysis pathway, Acetyl Co-A is the substance Roryh to produce turbines of all kinds, including menthol, and chlorophyll.

Some of the plants have an anti-growth effect on a number of plant pathogens and have increased interest in them for several characteristics, including the lack of resistance to pathogens and their side effects, as well as their low toxicity, rapid degradation, high specialization and non-pollution of the environment (Loknedra and Sharma, 1978).

Abadi (2003) noted that the water extracts of Ceratophyllumdemersum, Bacopamonniera, and Potamogetoncripus had significant effects in the killing of the isolates compared with control treatment after 63 days of treatment and had a role in inhibiting the germination of the seeds. Nezha et al. (2004) showed that the cystoseiratamericifolia extract was not effective against yeast and fungus Aspergillusflavus and Penicillium, while the 15% ethanol extract of all algae was effective in inhibition of fungi and yeasts. Nene and Thapliyal (1965) found that the soft leaf extract of Anagallisarvensis had a inhibitory effect on pythiumaphanidermatum when it was followed by the liquid culture technique. This effect is stronger when drying plants and testing its effectiveness after six months.

The boiling water extract of Embilicaofficinalis was found to have a inhibitory effect on the growth of P. aphanidermatum (Cupta and Banerjee, 1972).

Materials and methods of work

4 - 3 Agglutination media used to isolate and diagnose R.solani fungus

Potato DextrosAgar Potato Dextrose Acar

Prepare the medium by taking 100 g of sliced potato tubers into small pieces and boiling with 250 x 3 distilled water for 20-30 minutes in a glass beaker. After boiling, filter the mixture in a glass flask with a piece of gauze cloth to get the leachate. (10 g) of dextrose sugar and (9 g) of sugar in another 250 ml and then add the full-size potato sap to (half a liter). Dissolve the medium in glass flasks as needed. Add 125 mg / L of the antibiotic (Chloramphinicol) (20) minutes. After the sterilization period, the vials were left to cool and a portion of the media was placed in the dishes according to the required experiment and the other part was kept in the refrigerator until Use (Rugby, 2008).

4.3.2 Hot water extract

Then add 1000 g of the vegetative total of the mint (leg and leaves) only after cutting and washing them (into small pieces). Add 1000 ml (1 liter) of chopped water and boil for 20-30 minutes. After boiling, filter the mixture in another flask with a piece of gauze cloth (25%, 50% and 75%). The concentration was obtained 75% by adding 280 ml extract with 8 g of sugar and 8 g of sugar. Then added the distilled distilled water with a volume of 375 ml The concentration of 50% was obtained through the addition of 187 ml of extract with 8 g sugar and 8 g acar, Saved the size of 375 ml. The concentration of 25% was obtained by adding 95 ml of extract with 8 g sugar sugar. The water was added to the total diameter of 375 ml. Each concentration of the above concentrations of chloramphinicol was added approximately 95-100 mg.

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Laboratory experiments

Mushrooms were grown in the fungus Rhizoctoniasolani, Aspergillusniger, Aspergillusterreus, Fusariumoxysporumf.sp.Iycopersici, Fusariumoxysporum and obtained from the Plant Diseases Laboratory / Graduate studies on pre-prepared vegetable media in Petri dishes and the following treatments:

1. Central P.D.A only (comparative treatment).

2- In the center of hot water extract for mint and concentrates (25, 50, 75 and 100%).

A tablet of pure colonies of fungi was cultured at the center of each of the above treatments with three replicates per treatment. All the dishes were incubated at 25 + 2 ° C and 48,72,96,120,144,168 hours. The measurements of the colonies were taken for colonies and all concentrations. The rate of inhibition was calculated according to the following equation:

Country Growth in Comparison - National Growth in Treatment

% Inhibition = ---------- ----- x 100

Qatar's growth in comparison

According to Aboutt contained in (Sha'ban and Al-Malah, 1993)

5.4 Design and analysis of experiments statistically

Laboratory experiments were carried out according to the complete-randomized-design (C.RD) and one factor. The averages were compared using the least significant difference (D-D) and below the probability level (0.05).

5. Results and discussion

Effect of water extracts on the growth of pathogenic pathogens

The results of Table 1 show that the highest significant growth was achieved in the treatment of Rhizoctoniasolani, which was 4.49 cm compared with the lowest diuretic growth of fungi, which was obtained in the treatment of mushrooms Aspergillusterreus, which gave 1.82 cm. It was found that the concentrations used in this experiment have a significant effect on the growth of fungi if the PDA standard gave the highest diagonal growth of fungi of 3.65 cm compared with the lowest percentage achieved in the concentration of 100% which was 1.82 cm As for the interaction of mushroom type and concentration of the center was also significant if given Treatment of interference (Rhizoctoniasolani × PDA standard) highest fungal growth of 6.85 cm compared with the lowest growth in the national investigation of the interference treatment (Fusariumoxysporum × concentration) 100%, which gave a growth rate of 1.45 cm

Table (1) Effect of Different Concentrations of Peppermint Extract Additive to Plant P.9.A.D. in the Growth of Fungicides on the Second Day

Fungi P.D.A. 25% 50% 75% 100% Fungi Rate

Aspergillusniger 3.05 2.55 1.95 2.10 1.80 2.29

Aspergillusterreus 2.25 1.55 1.85 1.75 1.70 1.82

Fusariumoxysporumf.sp.Iycopersici 2.80 2.45 2.15 2.00 1.90 2.26

Fusariumoxysporum 3.30 2.65 2.30 2.25 1.45 2.39

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Rhizoctoniasolani 6.85 5.50 4.50 3.35 2.25 4.49

Concentration rate 3.65 2.94 2.55 2.29 1.82

L.S.D. 0.05 fungi = 0.526, concentration = 0.526, interference = 1.294

The results of Table (2) showed that there was a significant effect on the fungus used in the experiment, with the highest growth of Rhizoctoniasolani, which was 6.83 cm compared to the lowest growth of fungus, which was obtained in the treatment of Aspergillusterreus mushrooms, which reached 2.55 cm. It was also found that the concentrations used in this experiment have a significant effect In the growth of fungus if the standard PDA gave the highest fungal growth rate of 4.90 cm compared to the lowest growth achieved in the concentration of 100%, which was 2.29 cm. As for the interference mushroom type and concentration of the mean was also significant if the interference treatment (standard Rhizoctoniasolani x PDA)) The highest fungal growth was estimated at 9 cm (Fusariumoxysporum x concentration) (100%), which gave a diagonal growth of 1.60 cm

Table (2) Effect of Different Concentrations of Peanut Extract added to the Plant A.D.A.A in the Qatari Growth of the studied fungi on the third day

Averge funji	100%	75%	50%	25%	P.D.A.	funji
3.21	2.75	3.05	2.85	3.30	4.10	*Aspergillusniger*
2.55	2.55	2.55	2.70	1.65	3.30	*Aspergillusterreus*
2.95	2.15	2.35	3.00	3.25	4.00	*Fusariumoxysporum*f.sp.*Iycopersici*
2.76	1.60	2.40	2.60	3.10	4.10	*Fusariumoxysporum*
6.83	2.40	5.60	8.15	9.00	9.00	*Rhizoctoniasolani*
	2.29	3.19	3.86	4.06	4.90	Average con.
L.S.D. 0.05f = funji .7590 ،con. = 0.759 ، int. = 1.627						

The results of Table 3 showed a significant effect on the type of fungi in the study. The highest Qatari growth was achieved in the treatment of Rhizoctoniasolani, which gave a growth rate of 8.33 cm compared with the lowest growth of fungus, which was obtained in the treatment of Aspergillusterreus mushrooms which was 3.39 cm .

It was found that the concentrations used in this experiment have a significant effect on the growth of fungi if the PDA standard gave the highest fungal growth rate of 5.85 cm compared to the lowest growth achieved in the concentration of 100%, which was 3.71 cm.

The difference between the fungus type and the concentration of the medium was also significant if the interaction parameters (standard Rhizoctoniasolani × PDA), Rhizoctoniasolani × 25% concentration, Rhizoctoniasolani 50% concentration, Rhizoctoniasolani (75% concentration) The highest fungal growth of 9 cm compared with the lowest growth in the country achieved in the treatment of interference (Mushroom Fusariumoxysporum × concentration) 100%, which gave a diagonal growth of 2.45 cm.

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Table (3) Effect of Different Concentrations of Peanut Extract Additive to the Plantal Center P.D.A in the Qatari Growth of Fungicides studied on the Fourth Day

Average funji	100%	75%	50%	25%	P.D.A.	funji
3.76	3.30	3.85	3.55	3.65	4.45	*Aspergillusniger*
3.39	3.55	3.55	3.75	2.05	4.05	*Aspergillusterreus*
4.56	3.60	4.05	4.50	5.00	5.65	*Fusariumoxysporum*f.sp.*Iycopersici*
4.41	2.45	4.15	4.50	4.85	6.10	*Fusariumoxysporum*
8.33	5.65	9.00	9.00	9.00	9.00	*Rhizoctoniasolani*
	3.71	4.92	5.06	4.91	5.85	Average con.
L.S.D. 0.05= funji 1.053 ،con. = 1.053 ، int. = 2.507						

It is clear from the results of Table (4) that Hamak had a significant effect on the fungus used in the experiment. The highest growth was achieved in the Rhizoctoniasolani mushroom, which was 9 cm compared with the lowest growth of fungus, which was obtained in the treatment of Aspergillusterreus mushrooms, which reached 3.99 cm.

It was found that the concentrations used in this experiment have a significant effect on the growth of fungus if the PDA standard gave the highest growth of diuretic fungi of 6.64 cm compared with the lowest concentration of 100%, which was 5.07 cm.

In the same table it is found that the interaction between the fungus and the concentration of the medium has a significant effect also if the interaction parameters (Rhizoctoniasolani × PDA standard), Rhizoctoniasolani × 25% concentration, Rhizoctoniasolani 50% concentration, Rhizoctoniasolani concentration 75% And Rhizoctoniasolani (100% concentration). The highest diagonal growth was 9 cm in comparison to the lowest growth in the treatment of the parasite (Aspergillusniger × 100%) which gave a diagonal growth of 3.60 cm.

Table (4) Effect of Different Concentrations of Peppermint Extract added to Plant A.D.A.A. in the Growth of Fungicides on the Fifth Day

Average funji	100%	75%	50%	25%	P.D.A.	funji
4.17	3.60	4.10	4.25	4.25	4.65	*Aspergillusniger*
3.99	4.05	4.35	4.30	2.25	5.00	*Aspergillusterreus*
5.83	5.05	5.05	5.75	6.10	7.20	*Fusariumoxysporum*f.sp.*Iycopersici*
5.63	3.65	5.10	5.95	6.10	7.35	*Fusariumoxysporum*
9.00	9.00	9.00	9.00	9.00	9.00	*Rhizoctoniasolani*
	5.07	5.52	5.85	5.54	6.64	Av.con.
L.S.D. 0.05 = funji 0.624، con. = 0.624 ، int. = 1.772						

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The results of Table V show that the highest growth was achieved in Rhizoctoniasolani, which is 9 cm compared with the lowest growth of fungus, which was obtained in the treatment of mushrooms Aspergillusterreus, which was 4.69 cm and it was found that the concentrations used in this experiment have a significant effect in the growth of fungi if the PDA standard gave the highest fungal growth The fungus was 7.23 cm in comparison with the lowest concentration of 100%, which was 5.89 cm. For fungus, the fungus and concentration of the fungus was also significant if the interference coefficients (standard Fusariumoxysporum × PDA), Rhizoctoniasolani (PDA) 25 التركيز% concentration (Rhizoctoniasolani) (50% concentration), Rhizoctoniasolani (75% concentration) and Rhizoctoniasolani (100% concentration). The highest diagonal growth was 9 cm in comparison with the lowest growth in the treatment of interference (Aspergillusniger × 100%) which gave a growth rate of 4.65 cm.

Table (5) Effect of Different Concentrations of Peanut Extract Additive to the Plantal Center P.D.A in the Country Growth of Fungicides studied on the sixth day

Av.funji	100%	75%	50%	25%	P.D.A.	funji
4.84	4.65	4.45	5.00	5.05	5.05	*Aspergillusniger*
4.69	5.00	5.05	4.85	3.05	5.50	*Aspergillusterreus*
6.79	6.00	5.90	7.00	7.45	7.60	*Fusariumoxysporum*f.sp.*Iycopersici*
7.03	4.80	7.00	7.15	7.20	9.00	*Fusariumoxysporum*
9.00	9.00	9.00	9.00	9.00	9.00	*Rhizoctoniasolani*
	5.89	6.28	6.60	6.35	7.23	Av.con.
L.S.D. 0.05= funji 1.314 = con. 1.314 = التداخل ، 2.152						

The results of Table 6 show that the highest growth was achieved in Rhizoctoniasolani, which is 9 cm compared with the lowest growth of fungi, which occurred in the treatment of mushrooms Aspergillusniger, which was 5.40 cm.

It was found that the concentrations used in this experiment have a significant effect on the growth of fungi if the PDA standard gave the highest fungal fungal growth of 7.72 cm compared with the lowest concentration of 100% which was 6.64 cm.

The fungus type and center concentration were also significant if the interaction parameters (Fusariumoxysporumf.sp. Lycopersici x PDA standard), fungus (Fusariumoxysporumf.sp. Lycopersici × 25% concentration), (Fusariumoxysporum × PDA standard) (Rhizoctoniasolani × standard), Rhizoctoniasolani (25% concentration), Rhizoctoniasolani (50% concentration), Rhizoctoniasolani (75% concentration) and Rhizoctoniasolani (100% concentration). The highest fungal growth was 9 cm. In the treatment of interference (Aspergillusniger & 100%) which gave a fungal growth of 5.45 cm

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Table (6): Effect of Different Concentrations of Peanut Extract Added to the Plantal Concentration (P.D.A) in the Country Growth of Fungicides studied on the Seventh Day

معدل الفطريات	100%	75%	50%	%25	P.D.A.	الفطريات
5.40	5.45	4.80	5.85	5.45	5.45	*Aspergillusniger*
5.44	5.55	6.10	5.95	3.45	6.15	*Aspergillusterreus*
8.21	7.45	7.60	8.00	9.00	9.00	*Fusariumoxysporum*f.sp.*Iycopersici*
8.03	5.75	8.00	8.90	8.50	9.00	*Fusariumoxysporum*
9.00	9.00	9.00	9.00	9.00	9.00	*Rhizoctoniasolani*
	6.64	7.10	7.54	7.08	7.72	معدل التركيز
L.S.D. 0.05 = الفطريات 0.721 = التركيز ، 0.721 = التداخل ، 1.828						

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