



Isolation and identification of the fungi that cause rotting of fruits and vegetables found in the markets of Basra city

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ABSTRACT

This study aims to focus on isolating and diagnosing the fungi that cause fruit and vegetable damage in the city of Basra and identifying the types of fungi that cause fruit rot, which affects agricultural production and reduces production quantities. This study also aims to reduce the economic losses in fruits and vegetables due to the attack of microorganisms including fungi on fruits and vegetables. 10 types of fungi were isolated from infected fruits and vegetables in the city of Basra and displayed in the local markets The aim. of the study to identify mold-causing fungi in fruits and vegetables.

Keywords:

Health, Fruits, Vegetables, SDA, Energy, Vitamins, Mineral

Introduction:

Fruit is of great importance because it is a major source of vitamins and minerals in the human body. The fruit provides a sufficient amount of important fiber and produces cellulose, which helps prevent constipation. Eating meals Enriched with vegetables and fruits as part of an overall healthy diet may reduce the risk of heart disease, heart attack and stroke. Vegetables, especially sweet potatoes, beans, tomatoes, beets, and spinach, are a source of potassium (Ridgewell J 1998)which is an important component for lowering and controlling blood pressure. The benefits that can be obtained from consuming fruits and vegetables are increased life span.(Wolk, A Larsson SC, Bottai M, Bellavia, A Orsini N2013). Vegetables are important as they help control weight and improve overall health, and promote healthy hair and skin protect vital organs in the body, Antioxidants that aid in

digestion by preventing constipation, hemorrhoids and diarrhea and help keep diseases away from the body. Nutritional deficiencies occur due to a lack of Knowing the nutritional values of vegetables and fruits, or due to a lack of daily fruit and vegetable consumption.(Ruel MT, Nicholas M, Lisa S2011). fruit consumption ensures optimum health, gives the body Provides immediate energy minerals and vitamins beneficial for the functioning of the body.(Kozłowska A, Szostak-Wegierek D. Flavonoids2014). Pectin-degrading enzymes are the first enzymes secreted by pathogenic fungi when they attack the cell walls of fruits and vegetables The first enzyme that degrades the cell wall, which is secreted by the fungus, is one of the most important factors of virulence possessed by the pathogenic fungus..(A.;Sella, , Tomassini, ovidio, L.;Raiola,A.;D R.2009) External conditions such as insect infestation and

wounds facilitate the entry of fungi to fruits and vegetables.

Materials and working method:

Sample collection:

A group of fruits and vegetables displayed in the markets of the city of Basra were selected. For each type, symptoms of fungal infection appeared for a period of 6 months from 3-2022 until 9-2022.

Isolation of fungi from fruits and vegetables

Fruit and vegetable samples were washed with running water for 20 minutes, cut into small pieces 5.0 cm from the affected area, sterilized, and treated with 1% NaCl solution for 5 minutes. Chloramphenicol and neomycin are added to prevent bacterial growth at a concentration of 50 mg/L before solidifying. incubated Plates at 27°C for 7 days.

Fungus purification:

After the growth of the fungi on the medium of PDA, the fungi were purified by taking the developing colonies and the mycelium, and they were transferred to dishes containing sterilized PDA .

Fungus diagnosis:

Fungal diseases can be diagnosed successfully by: Knowing the basic rules of plant disease classification. Description of the characteristic symptoms.

Searching for signs of disease (the presence of mycelium - fungal spores - by using a manual lens. . Are the symptoms associated with specific parts of the plant.

After they grew It was diagnosed on the phenotypic form and under the light microscope, and according to the international taxonomic keys.

Results and discussion

10 types of mold-causing fungi were isolated in fruits and vegetables in the markets of Basra city for a period of 6 months from 3-2022 until 9-2022. The aim of the study to identify mold-causing fungi in fruits and vegetables (Tournas, V.H.;Katsoudas, E.) To reduce economic losses in fruits and vegetables and avoid their transmission to consumers and their consumption.

Table 1-shows isolated fungi during the first 6 months

isolated fungus	no
Alternaria Alternaria	1
Aspergillus flavus	2
Penicillium sp	3
Aspergillus niger	4
Cephalosporium spp	5
F.solani	6
F.oxysporum	7
Rhizoctonia solani	8
Rhizopus stolonifer	9
Humicola sp	10

In months 3 and 4 2022, the most frequent occurrence appeared Alternaria Alternaria at 21% and 45%, respectively, While the Penicillium fungus appeared with the highest frequency in the sixth and ninth months, by 23% and 55%, respectively (Pitt; J.L;Hocking ,A.D.(2009). While the isolation of Aspergillus flavus was in the 7th and 8th months, with a frequency of 14% and 28%, respectively. While the isolation of Aspergillus niger was in the 3th with a frequency of 20% and Cephalosporium spp in the 5th with a frequency of 12% and F.solani in the 7th and 8th months with a frequency of 4.1% and 8.2% respectively and the isolation of F.oxysporum was in the 4th with a frequency of

22% and isolation of *Rhizoctonia solani* was in the 9th with a frequency of 18% and isolation of *Rhizopus stolonifer* was in the 6, 7, 8 th with a frequency of 33%, 25%, 4,1% respectively and isolation of *Humicola sp* was in the 5th with a frequency of 13%.

Table -2- shows the percentage of fungi isolated from fruits and vegetables presented in the market during 6 months

%Frequency Ratio	Months	isolated fungus	no
21% and 65% respectively	3,4	<i>Alternaria Alternaria</i>	1
14% and 28% respectively	7,8	<i>Aspergillus flavus</i>	2
23% and 55% respectively	6,9	<i>Penicillium sp</i>	3
20%	3	<i>Aspergillus niger</i>	4
12%	5	<i>Cephalosporium spp</i>	5
4.1% and 8.2% respectively	6,8	<i>F.solani</i>	6
22%	4	<i>F.oxysporum</i>	7
18%	9	<i>Rhizoctonia solani</i>	8
33%, 25%, 4,1% respectively	6,7,8	<i>Rhizopus stolonifer</i>	9
13%	5	<i>Humicola sp</i>	10

Table -3 -shows the fungi isolated from vegetables that belong to 5 plant families and to 8 types of vegetables found in the markets of Basra city.

Fruit or vegetable name	Scientific name	name of the fungi isolate	plant family
Tomato	<i>Lycopersicon esculentum</i>	<i>A. alternata</i>	Solanaceae
		<i>Aspergillus niger</i>	
		<i>Penicillium sp</i>	
		<i>F. oxysporum</i>	
potatoes	<i>Solanum tuberosum</i>	<i>A. alternata</i>	Solanaceae
		<i>Aspergillus niger</i>	
		<i>Aspergillus flavus</i>	
lettuce plant	<i>Lactuca sativa</i>	<i>A. alternata</i>	Asteraceae (Compositae)
Carrot Plant	<i>Daucus carota</i>	<i>Humicola sp.</i>	Ammiaceae (Umbelliferae)
		<i>Rhizoctonia solani</i>	
cucumber	<i>Cucumis sativus</i>	<i>Cephalosporium sp</i>	Cucurbitaceae
		<i>R. solani</i>	
		<i>Penicillium sp</i>	
		<i>Rh.stolonifer</i>	
Celery	<i>Apium graveolens</i>	<i>F. solani</i>	Ammiaceae (Umbelliferae)
		<i>A. alternata</i>	
		<i>Penicillium sp</i>	

leek plant	Allium porrum	R. solani	Liliaceae
		A. alternata	
			Solanaceae
Pepper	Capsicum annum	A. alternata	
		As. Niger	

Table -4 -shows the fungi isolated from fruits that belong to 3 plant families and to 4 types of fruits found in the markets of Basra city.

Fruit or vegetable name	Scientific name	name of the fungi isolate	plant family
orange	Citrus sinensis	A. alternata	Rutaceae
Apples	Malus domestica	Aspergillus niger	Rosaceae
		R. solani	
		Aspergillus flavus	
banana	Musa paradisiacal	Aspergillus niger	Musaceae
Strawberry	Fragaria chiloensis	A. alternata	
		Aspergillus niger	
		Rh.stolonifer	

The most types of fungi causing damage to fruits and vegetables have been identified in the markets of the city of Basra, which can cause economic loss in agricultural output, which requires taking many measures to limit the spread of fungi and their cause in damaging fruits and vegetables. (Hoque,J.;Shamsi,S.(2011).

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