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Isolation and Diagnosis of Fungi from Samples of Spices in the City of Nasiriya

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***Abstract*— Examination of (35) samples of spices obtained from local markets for the purposes of isolating and diagnosing fungi growing on them. Anine isolates belonging to 13 different types of fungi were diagnosed by the standard dilution method with three replications, and it has been observed that the most samples from which the fungi were isolated is ginger. It was found that the most isolated species of fungi are *Penicillium, Aspergillus*, and *Rizupes spp*. A rare colony of fungi was observed, which indicates contamination of the spices under study with the fungus. The present study aims to identify the potential risks of the presence of fungi in spices and what may result from mycotoxins that may be the cause of many chronic diseases as a result of using these spices in large quantities. The study recommends limiting the use of contaminated spices, especially ginger, in preparing food and its uses, in addition to other types such as cloves, black and white pepper, and other types of spices found in the local markets, especially the expired ones..**

Keywords*— *spices, fungi, ginger ,black and white and Aspergillus

I. INTRODUCTION

Spices and herbs from the foot have been used as foodpreservatives and fragrances as preservatives for most canned foods. There are more than 30 kinds of spices usedin cooking, including black pepper, curry, cumin and turmeric, the most famous in the world. In addition to cooking, In many other areas, the paperless part of the plant is often used, such as buds or roots, such as in ginger or grains, such as black pepper and cumin (Dimic*et al*.,1995).

The most common spices are black pepper, red pepper, cumin, cinnamon, ginger, cloves, mustard and mint. (Ayres*et al*., 1980). Due to the harvesting conditions and improper storage methods, these herbs and spices are susceptible to fungal contamination, which may produce fungal toxins, and this is a cycle that poses a great danger to the consumer (Abou Donia, 2008; Dincoglu and Kara, 2006). The presence of molds and fungi in spices may result from exposure to air containing spores Those fungi, the most important The fungal contaminants in the spices are the genus Aspergillus spp and the genus Pancillium spp (Dincogluand Kara, 2006; Forbes*et al.*, 2007;Koci-Tanackov*et al.*,2007; Ayres*et al.*, 1980). It has been found that some spices when stored in low temperatures are also susceptible to pathogenic fungi.

This study aimed to:Isolation and diagnosis of fungi from the samples of spices taken from the local markets of the city of Nasiriyah.

II. MATERAIL AND METHODS

1- Collection of samples:

35 samples of spices were collected from 1/3/2017 to 3/5/2017 from local markets, the samples included turmeric, cardamom, black pepper, redpepper, cumin, curry, ginger and cloves.Samples were collected in bags made of polyethylene؛ Samples were kept in the refrigerator at a temperature of 4 m until use.

2. Isolation and identification of fungi:

Dilution method was used to determine the fungal species in the spice samples on the dilution method with three replicates per sample. If 10 g per sample (fine powder) and 90 mL of sterile saline solution were taken,Put in the device Shaker for 30 minutes and stop for 10 minutes with intermittent vibration, then attended a series of blowers and used the last dilution for the purpose of vaccinating Petri dishes containing the center of the plant potato Dextrose - Agar (PDA) for the purpose of isolation and identification of fungi. On the taxonomic keys and as described in (Baker, 1967; Forbes*et al*., 2007;Abdel-Fattah*et al*., 2010).

Percentage of appearance% =

Number of samples in which one type was found

X 011 Percentage of frequency (insulation)=

Number of isolates of each type Total number isolates All species X 01 .

III. RESULTS AND DISCUSSION

Nine fungal strains were isolated from the studied spice samples (Table 1), including the fungus Aspergillus, penicillium, Mucor spp, cladosporium, Acremonium, Alternaria, Stemphylium botryosum, Rhizopus,Stemphylium botryosum, Trichoderma The genus penicillum and Rhizopus were the most common in spice, while the appearance of the genus Aspergillus was lower than that. This was consistent with variant 8, if the penicillum spp, Rhizopus and Aspergillus spp were found to be the most common in the spice samples studied and 93fungi While the rest of the fungi showed a lower percentage. The genus of the pencillium was represented in two species while the appearance of the Rizupes was represented by a species One was lost, but the genus Aspergillus was two types, but at a lower rate than the previous. Among the species detected were Aspergillus, Penicillium spp and Rhizopus. This is consistent with Magnificence (Bugno*et al.*, 2006; El-Kady*et al.*, 1995), As they found that the genus Penicillium is found in abundance in cardamom, cinnamon, coriander, cumin, black pepper and white pepper while isolating the researcher (Bhat*et al.*, 2003) Aspergillus and the of Rhizopus and Penicillium species but in different proportions of many kinds of spices, the researcher found Aspergillus flavus is most commonly found in black pepper, especially when the conditions are favorable for its growth of temperature, humidity and others(Ayres *et al.*, 1980;Baker, 1967). It was noted that the environmental conditions have a clear effect on the growth and increase of the number of fungi, if it found that spices stored in unhealthy environmental conditions are more susceptible to pathogenic fungi.The emergence of the fungal

N	Fungal species isolated from spices
1	Aspergillus niger
2	Aspergillus flavus
3	Aspergillus ochraceus
4	Acremonium
5	Alternaria
6	cladosporium
7	Mucor spp
8	Penicillium arenicola
9	Penicillium brevicompactum
10	Penicillium corylophilum
11	Rizupes spp
12	Stemphylium botryosum
13	Trichoderma

Aspergillius, Peicillium, Rhizupes in most spices indicates that these fungi are dominant in their presence on spices and this is largely consistent with a number of researchers (Bugno*et al.*, 2006; Azi*et al.*, 1991; Forbes*et al.*, 2007). We note from the results of the research that the fungi most commonly found in Black pepper, cumin and coriander is a penicillium while isolating the Aspergillus genus of mustard, white pepper and turmeric and this is consistent with (Baker, 1967).

Mustard	ginger	coriander	cardamom	curry	pepper white	Pepper black	turmeric	Cumin	Spices / fungi
-	+	+	+	+	-	+	+	+	Penicillium arenicola
-	+	+	+	-	-	-	-	+	Penicillium brevicompactum
-	+	+	+	-	-	+	-	+	Penicillium corylophilum
+	+	-	-	+	+	-	+		Aspergillus niger
+		-	-	-	--	-	+		Aspergillus flavus
+	+	-	-	-	+	-	+		Aspergillus ochraceus
-	+	-	-	+	-	+	-		cladosporium
-	-	+	+	-	-	-	-		Acremonium
-	-	-	-	+	-	-	-		Alternaria
+	-	-	-	+	-	+	-		Mucor spp
+	+	+	+	-	+	+	-	+	Rizupes spp
--	+	-	-	-	-	-	-	+	Trichoderma
--	--	-	+	-	-	-	+	-	Stemphylium botryosum

TABLE.1.shows species and fungal species isolated from spices

TABLE.2.shows the types of spices and fungi isolated from the
- mean the presence of fungi
- mean no fungi

Table (2) shows that the most common fungal species isolated from the studied samples were the fungus Penicillium Arenicola, which was repeated in both(Cumin,turmeric,Pepper, curry, cardamom, coriander, ginger, Mustar) andRizupes and Penicillium corylophilum, which was repeated in each(Cumin,Pepper ,cardamom, coriander, ginger, Mustard).of the most common spices, That is ginger. While the lowest number of fungal colonies were observed in Pepper while different percentages of results were recorded, possibly due to different spice components, storage conditions and other preservatives. Most of the fungicides present in the spice samples are found on the spices before and after the harvest and develop in their growth after storage due to

the method of storage, moisture and heat that help in their growth (Koci-Tanackov*et al.*,2007).

IV. RECOMMENDATION

The results showed that spices are contaminated with some fungal species that may be dangerous to human health. We recommend the following: - Conduct continuous laboratory tests to prevent the use of contaminated spices. 0 - Import good spices and complying with international standards. 3 - Attention to the way and places of storage of spices in places far from the sun and poor storage conditions. The storage areas shall be well ventilated and dry. 4 - Conducting studies on spices to assess their quality and to educate people about the potential risks of eating poor types as they may be contaminated with fungi that produce toxins and cause in many diseases.

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