

قسم : الصحة ومراقبة الأغذية - كلية الطب البيطرى - جامعة أسيوط.  
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### دراسة عن الفطريات المتواجدة فى الجبن والزبد المصرى

سهام محمود ، حسنى عبد اللطيف ، صبرى درويش، رجاء شحاته

تتميز الفطريات بقدرتها على تحمل الظروف المختلفة من ناحية احتياجاتها الغذائية وكذلك من حيث ظروف البيئة المحيطة بها . ولهذا تأثير كبير فيما تسببه الفطريات من مشاكل فى منتجات الالبان سواء عن طريق ما تسببه من فساد للمنتج أو تكون نكهات غير مرغوبة أو الاضرار بالمستهلك .

لذلك أجريت تلك الدراسة على ثمانين عينة عشوائية ( أربعمون من الجبن ومثلها من الزبد ) جمعت من مدينتى القاهرة والجيزة لعزل وتصنيف ما قد يوجد بها من فطريات .  
ودلت النتائج على أن متوسط العدد الكلى للفطريات فى الجرام الواحد من الجبن هو ٥٣٧٥ وفى الزبد ٥٥٢٥ .

تم عزل الفطريات الآتية من الجبن والزبد .

*Aspergillus, Penicillium, Cladosporium, Alternaria, Geotrichum, Mucor, Rhizopus and Absidia.*

بينما عزل فطر الـ *Fusarium* من الجبن فقط

*Aspergillus and Penicillium*

وقد تبين تصنيف ما عزل من فطرى

وجود الانواع الآتية فى كل من الجبن والزبد

*A. niger* V. Tieghem, *A. fumigatus* Fres., *A. flavus* Link, *A. candidus* Link

*A. nidulans* (Eidam) Wint

*A. versicolor* Tiraboschi

*A. clavatus* Desm.

*A. terreus* Thom

فى الجبن فقط ،

كما تواجدت هذه الانواع من البنسلين فى كل من الجبن والزبد

*P. verrucosum* var. *cyclopium*, *P. ver. verrucosum*, *P. chrysogenum*,

*P. citrinum* and *P. atramentosum*.

*P. griseofulvum*, *P. brevicompactum*, *P. camemberti*

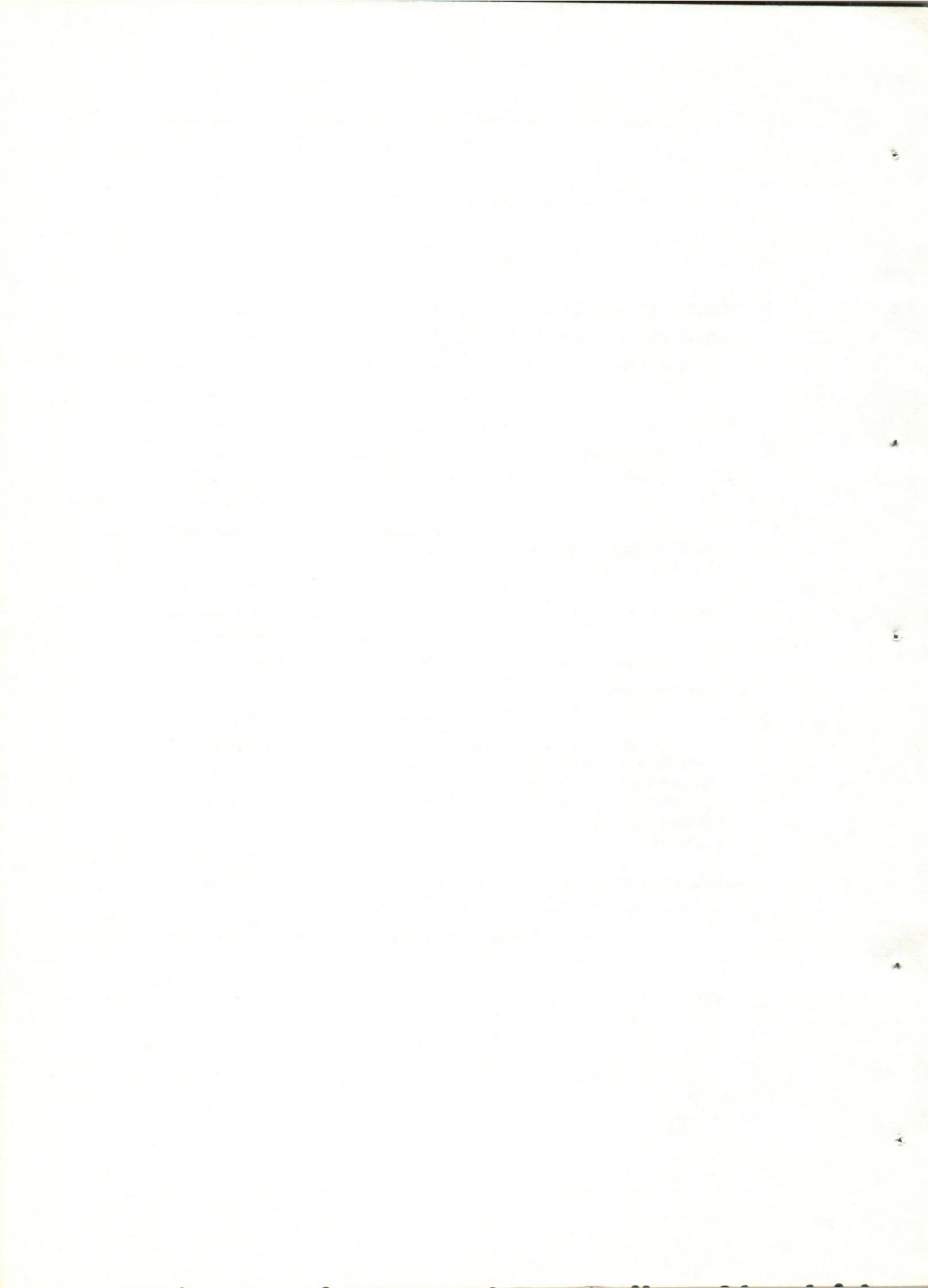
بينما وجد

*P. funiculosum*, *P. roqueforti*, *P. lilacenum*, *P. caseicolum* and

*P. sublateralitium*

فى الجبن فقط

وتمت مناقشة النتائج وتأثير الفطريات المعزولة على كل من المنتجين وكذلك من ناحية تأثيرهم على الصحة العامة والاشتراطات الصحية الواجب توافرها فى تصنيع الجبن والزبد المحلى لتحسين نوعيته حفاظا على المنتج من الفساد ورعاية للصحة العامة .



MYCOLOGICAL STUDIES ON EGYPTIAN SOFT CHEESE AND COOKING BUTTER  
(With 4 Tables)

By  
SEHAM, M. MAHMOUD; H.A. ABD EL RAHMAN\*, S.D. MORGAN and R.S. HAFEZ  
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SUMMARY

Eighty samples of Damietta cheese and cooking butter (40 samples each) were subjected to mycological examination.

The total mould count/g. of Damietta cheese ranged between 100-1200 with a mean value of  $537.50 \pm 55.20$ , while in cooking butter the total mould count ranged between 300-1400, with a mean value of  $552.50 \pm 47.56$ .

Moulds isolated from both Damietta cheese and cooking butter belonged to the following genera: *Aspergillus*, *Penicillium*, *Cladosporium*, *Alternaria*, *Geotrichum*, *Mucor*, *Rhizopus*, *Absidia*. Genus *Fusarium* could be isolated only from Damietta cheese.

Identification of isolated *Aspergillus* and *Penicillium* spp. revealed that *A.niger*, *A.fumigatus*, *A.flavus*, *A.candidus* and *A.versicolor* could be isolated from both Damietta cheese and cooking butter. While *A.nidulans*, and *A.calvatus* could be isolated from Damietta cheese, and *A.terreus* from cooking butter. *Penicillium* species isolated from both Damietta cheese and cooking butter were *P.verrucosum* var. *cyclopium*; *P.ver.verrucosum* *P.chrysogenum*, *P.citrinum*, and *P.atramentosum*, while *P.griseofulvum*, *P.brevicompactum* *P.camemberti*, *P.funiculosum*, *P.roqueforti*, *P.lilacinum*, *P.caseicolum* and *P.sublateritium* could be isolated only from Damietta cheese. Suggested measures for improving the quality of the products are discussed.

INTRODUCTION

Mouldy foods and feeds may cause serious disease outbreaks in man and animals. Recently it is already known that at least about 250 different types of moulds form toxic substances to man and animals when grown in certain foods under favourable conditions.

In addition to the so called aflatoxins, other mycotoxins may be of great significance and producing food-borne illness in human beings. SERK-HANSEN (1970), ENOMOTO and SAITO (1970), and DEGER (1976).

Moreover, various species of moulds play an important role in spoilage and discoloration of many dairy products such as cheese and butter FOSTER *et al.* (1958), MOSSEL (1975) and JAY (1978).

As Damietta cheese and cooking butter are among the most popular dairy products consumed in Egypt. Therefore, the aim of this investigation was undertaken to throw light on the rate of mould contamination of both products.

MATERIAL and METHODS

Eighty samples, 40 each of Damietta cheese and cooking butter were collected in sterile jars from different groceries in Cairo and its suburbs. Collected samples were immediately transferred to the laboratory for mycological examination.

Mould Count:

The technique adopted is that recommended by APHA (1978).

Preparation of serial dilution:

Eleven grams from the prepared cheese sample were thoroughly emulsified into 99 ml. of warm sod. citrate solution (2%) to have a dilution 1:10, from which 10-fold serial dilutions were prepared.

Similar decimal serial dilutions were made from already prepared butter sample. Duplicate plates of malt

\* : Dept. of Hygiene and Preventive Medicine, Fac. of Vet. Med., Assiut University.

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extract agar, were inoculated each with one ml. from each serial dilution before being incubated at 25°C. for 5 days. The average number of colonies per gram sample was calculated and registered. Suspected mould colonies from both products, according to their morphological characteristics, were isolated to be identified according to RAPER and FENNELL (1965), and SAMSON (1976) for the genus *Aspergillus*; RAPER and THOM (1949), ARX (1967), KULIK (1968) and SAMSON *et al.* (1970) for genus *Penicillium*.

The other genera were identified according to ZYCHA *et al.* (1969) and BARNNETT and HUNTER (1972). Results obtained were recorded.

## RESULTS and DISCUSSION

Results given in Table (1) reveal that the mould count/g. of examined samples of Damietta cheese ranges from 100-1200, with a mean value of  $537.50 \pm 55.20$ . The highest frequency distribution of examined samples (72.5) lies within the range 100-700 (Table 2).

Nearly similar findings were reported by ABD EL-RAHMAN (1972), JANTE *et al.* (1972) and SHELAIH (1979).

While incase of cooking butter the total mould count/g. sample varied from 300 to 1400, with a mean value of  $552.50 \pm 47.56$ . The highest frequency percentage (52.5%) lies within the range 400-700 Table (2).

These findings substantiate what has been reported by MILOHNOJA and BRIGIEZ (1965), MILOHNOJA (1972) and CANTON *et al.* (1975).

Incase of cooking butter eitht genera of moulds could be identified. *Geotrichum* spp. were the most prevalent (80%), while *Alternaria* spp. and *Absidia* spp. were the lowest (2.5%); *Penicillium* spp., *cladosporium* spp.; *Aspergillus* spp., *Mucor* spp. and *Rhizopus* spp. lie inbetween.

Nearly similar results were reported by KRISHNASWAMY (1949), PECEK and PETRICIC (1963), MILOHNOJA & BRGIEZ (1965), and BKHEET (1976).

The percentage distribution of isolated *Aspergillus* and *penicillium* spp. from both products given in (Table 4) reveals that 7 and 6 different species of *Aspergillus* could be identified from both cheese and butter samples respectively. While 13 and 5 different spp. of *Penicillium* from both products respectively.

It is worth mentioning that *A.flavus*, *A.clavatus*, *A.nidulans*, *A.terreus* and *A.versicolor* as well as *P.cyclopium* and *P.roqueforti* are considered as mycotoxins producers MOSSEL (1975), FRAZIER and WESTHOFF (1978) and BULLERMAN (1980).

The existance of moulds in nature under sever ecological enviroments as being able to withstand more unfavorable conditions than other microorganisms renders thier destruction or elimination a serious problem encountered by food scientists, consequently perpetual investigations are continously undertaken aiming to find new methods and technology to save these products from being spoiled on the market, and to safe-guard consumers from being infected.

Educational programmes should be imposed to producers, processors and handlers to improve the quality of these products.

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Table (1)  
Statistical analytical results of mould count/g. sample

	Damietta cheese	Cooking butter
Minimum	100	300
Maximum	1200	1400
Mean	537.50	552.50
SE.M ±	55.20	47.56

Table (2)  
Frequency distribution of examined samples based  
on their mould count/g.

Range	Cheese		Butter	
	No. of samples	%	No. of samples	%
100 - 400	16	40.0	10	25.0
400 - 700	13	32.5	21	52.5
700 - 1000	2	5.0	6	15.0
1000 - 1300	9	22.5	-	-
1300 - 1400	-	-	3	7.5

Table (3)  
Incidence of isolated moulds from examined samples

isolate of mould spp.	Cheese		Butter	
	No. of samples	%	No. of samples	%
Aspergillus	27	67.5	8	20.0
Pencillium	24	60.0	13	32.5
Cladosporium	12	30.0	9	22.5
Alternaria	5	12.5	1	2.5
Geotrichum	3	7.5	32	80.0
Mucor	2	5.0	4	10.0
Rhizopus	2	5.0	2	5.0
Absidia	1	2.5	1	2.5
Fusarium	2	5.0	-	-

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Table (4)  
Frequency distribution of isolated *Aspergillus* and *Penicillium* spp.

Isolates	Cheese		Butter	
	No. of sample	%	No. of sample	%
<i>A.niger</i>	10	15.0	2	5.0
<i>A.fumigatus</i>	10	25.0	1	2.5
<i>A.flavus</i>	4	10.0	2	5.0
<i>A.candidus</i>	5	12.0	1	2.5
<i>A.versicolor</i>	4	10.0	1	2.5
<i>A.nidulans</i>	1	2.5	-	-
<i>A.clavatus</i>	2	5.0	-	-
<i>A.terreus</i>	-	-	1	2.5
<i>P.verrucosum</i> var. <i>cyclopium</i>	9	22.5	11	27.5
<i>P.ver.verrucosum</i>	4	10.0	1	2.5
<i>P.griseofulvum</i>	5	12.0	-	-
<i>P.chrysogenum</i>	2	5.0	5	12.5
<i>P.brevicompactum</i>	1	2.5	-	-
<i>P.citrinum</i>	4	10.0	1	2.5
<i>P.camemberti</i>	1	2.5	-	-
<i>P.funiculosum</i>	1	2.5	-	-
<i>P.roqueforti</i>	3	7.5	-	-
<i>P.lilacinum</i>	2	5.0	-	-
<i>P.caseicolum</i>	1	2.5	-	-
<i>P.atramentosum</i>	1	2.5	2	5.0
<i>P.sublateritium</i>	1	2.5	-	-

