

**INFLUENCE OF THE COWPEA WEEVIL,
CALLOSOBRUCHUS MACULATUS F., AND THE
SAW - TOOTHED GRIN BEETLS, *ORYZAEPHILUS*
SURINAMENSIS L. ON THE MOISTURE CONTENT
AND MOULD GROWTH IN STORED GRAINS**

BY

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ABSTRACT

Presence of the cowpea weevil, *Callosobruchus maculatus* F., and the saw-toothed grain beetle, *Orvxaepphilus surinamensis* L., and their propagation in cowpea and wheat, resulted in raising the moisture content of infested grains. The increase in moisture content of infested grain was greater at higher relative humidity (60 %) than at lower one (40 %). The 80 % relative humidity was unfavourable to both tested insects. The moisture content of the noninfested grains remained in equilibrium with atmospheric moisture.

Fungi grew and developed more readily and in greater numbers in infested grain than in non infested one. The storage fungi continued growing in infested grains even after the death of all insects.

The majority of storage fungi isolated from the tested grains belong to the genera *Aspergillus*, *Penicillium*, *Alternaria*, and *Fusarium*. *A. glaucus*, *A. fumigatus*, and *Penicillium rubrum* dominated the isolated mould counts.

INTRODUCTION

Ecological studies on stored - grain bulks have shown close association between insects and fungi. An understanding of these associations might be useful in determining the causes of deterioration of stored sereals and their food products. A principal limiting factor to this association is the moisture content of the stored grains. The influence of stored grain insects on the moisture content of stored grains has been studied by various authors (Robinson. 1926, Agrawal *et al.* 1957, Misru *et*

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al., 1961, Soliman *et al.*, 1974). The relations between stored grain insects and fungi have been techlied by Robinson (1926), Agrawal *et al.*, (1957, 1958), Christensen (1946, 1957), Christensen and Hodson (1960), Misru *et al.*, (1961), Loschiavo and Sinha (1966), Sinha (1966, 1971), Abdel - Rahman (1967), Abdel - Rahman *et al.*,(1969),Hill (1978), Ivbijaro *et al.* (1979), and Wright *et al.*, (1980, 1983).

The present investigation is an attempt to point out the influence of two of the common stored grain insects *Callosobruchus maculatus* F. and *Oryzaephilus surinamensis* L. on the moisture content and mould growth in stored cowpea and wheat.

MATERIALS AND METHODS

1 - Maintenance of cultures

Insects used in the present study were taken from stock culture maintained in the Department of Entomology, Faculty of Sciernce, Ain Shams University. The cowpea weevils were reared on the pea *Vigna unguiculata*, conditioned to 12 - 13 % moisture content. The saw boothed grain beetles were reared on the wheat, *Triticum aestivum*, (Giza 155), conditioned to 14 - 15 % moisture content. The cultures were reared in 5 - gallon jars, covered with screen caps, and kept at 75 % relative humidity and a temperature of 25 °C. The grains were obtained just after harvesting and before storage. They were cleaned and autoclaved and then put in nylon bags, one kilogram each, and kept in reftigerators.

2 - Measurement and adjustment of moisture content of grains

The moisture content of grains was measured according to the technique described by Christensen (1957).

3 - Culturing of storage fungi

Storage fungi were cultured on the medium recommended by Christensen (1957). The medium was malt salt agar (MSIO), consisting of 2 % malt extract, 2 % agar, and 10 % sodium chloride.

4 - Mould count

Mould count was carried out by the method described by Christensen (1957).

5 - Isolation of fungi from the grain

Seeds of pea and wheat (infested with stored grain pests) were cultured without surface disinfection. Many Kernels after surface disinfection in 2 % sodium hypochlorite for one minute, followed by a sterils water rinse, were split and placed on agar with the cut surface of the embryo upward, so that fragments of mycelium could be transferred as soon as they became visible. The inoculum was then prapared and the fungi were isolated according to the technique described by Christensen (1957).

RESULTS

The influence of *C. maculatus* and *O. surinamensis* on the moisture content of the grain is presented in Table 1, and shown graphically in Figs. 1 - 6.

Data in Table 1 whow that the moisture content of infested grain is generally higher than the noninfested one. Under storage conditions of 40 %, 60 %, and 80 % R.H., the cowpea weevils raise the moisture content of the infested grain from 9.10 %, 11.40 %, and 23 %, to 9.90 %, 27.73 %, and 24.40 % on average, respectively, at the end of storage period. The corresponding values for the noninfested grains are 9.49 %, 17.63 %, and 24.29 % respectively. All weevils of the start infestation die during the first month of storage period, but the population of their progeny increases during the succeeding five months of storage to attain an average of 850 and 1520 weevils at 40 % and 60 % R.H., respectively.

The same trend is noticed with the stored wheat infested with the saw - toothed grain beetle, though less remarkable than that recorded for the infested cowpea. Under the same conditions of storage, the original moisture contents of 10.00 %, 12.00 %, and 18.80 %, rise up to averages of 10.45 %, 13.61 %, and 24.68 % respectively, during the same storage period. The 50 beetles of the original infestation increases to 377 and 1454 on average during five months of storage at 40 % and 60 % R.H., respectively.

It is evident that the 80 % R.H. is unfavourable for the development of the used pests. At this relative humidity all adults of the start infestation soon die before propagation.

It may be noticed from table (2) that the noninfested cowpea remains mould free throughout the firstr four months of storage. Otherwise, both infested and noninfested pea and wheat soon become invaded by storage fungi under the used

Table 1

Average moisture content (m.c.) of cowpea infested with *Callosobruchus maculatus* F. (A), and wheat infested with *Oryzaephus surinamensis* L. (B), stored for six months at 40 %, and 80 % R.H.

Storage time (in months)	inspect species	40 % R.H.				60 % R.H.				80 % R.H.			
		No. of adults		M.C.		No. of adults		M.C.		No. of adults		M.C.	
		dead	Total	Check	Infes.	dead	Total	Check	Infes.	dead	Total	Check	Infes.
start	A	50		9.10		50		11.40		50		23.00	
	B	50		10.00		50		12.00		50		18.80	
One	A	0.00	50	9.13	9.29	0.00	50	11.65	13.41	100	50	23.12	23.55
	B	10.16	90	10.14	10.32	5.34	50	12.13	12.13	100	50	18.96	20.21
Two	A	92.60	302	9.27	9.56	23.00	385	12.01	13.99	100	50	23.34	23.75
	B	13.90	153	10.17	10.33	23.50	102	12.56	12.31	100	50	19.71	22.65
Three	A	91.40	399	9.36	9.65	95.60	788	12.79	15.77	-	-	23.90	23.94
	B	53.70	193	10.32	10.35	86.50	466	13.09	12.50	-	-	20.08	22.33
Four	A	91.20	846	9.36	9.82	84.15	1418	15.58	25.58	-	-	24.10	24.11
	B	49.80	234	10.48	10.50	8.50	913	14.14	13.21	-	-	21.22	23.76
Five	A	100.00	850	9.38	9.85	100.00	1520	16.52	27.56	-	-	24.18	24.25
	B	35.80	377	10.50	10.39	7.65	1454	14.23	13.41	-	-	22.36	24.38
Six	A	100.00	853	9.49	9.90	-	-	17.63	27.73	-	-	24.29	24.40
	B	27.50	492	10.52	10.45	39.57	1513	14.33	13.61	-	-	23.57	24.68

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Table 2

Average mould count of cowpea infested with *C. maculatus* (A), and wheat infested with *O. surinamensis* (B), stored for six months at 40 %, 60 %, and 80 % R.H., and 25 % \pm 1 °C.

R.H. %	Used Insect	Status of grain	Time of Storage in months					
			One	Two	Three	Four	Five	Six
40	A	Check	0.0	0.0	0.0	0.0	3.3×10^2	3.3×10^2
		Infes.	0.5×10^2	1.6×10^2	7.8×10^2	1.3×10^3	6.0×10^2	10.7×10^3
	B	Check	3.0×10^3	7.0×10^3	10.0×10^3	13.0×10^3	16.0×10^3	17.0×10^3
		Infes.	15.6×10^3	14.0×10^3	13.0×10^3	8.0×10^3	4.0×10^3	3.0×10^3
60	A	Check	2.0×10^3	4.0×10^3	1.0×10^3	1.0×10^3	60.0×10^4	17.0×10^5
		Infes.	72×10^2	72×10^3	59.0×10^3	17.0×10^9	38.0×10^9	58.0×10^9
	B	Check	1.0×10^3	2.0×10^3	2.0×10^3	28.0×10^3	74.0×10^3	192.0×10^3
		Infes.	105.0×10^3	86.0×10^3	65.0×10^3	56.0×10^3	47.0×10^3	38.0×10^3
80	A	Check	9.0×10^8	55.0×10^8	15.0×10^9	19.0×10^9	22.0×10^9	26.0×10^9
		Infes.	46.0×10^8	83.0×10^8	16.0×10^9	20.0×10^9	24.0×10^9	28.3×10^9
	B	Check	56.0×10^3	46.0×10^5	34.0×10^6	22.0×10^7	12.0×10^8	18.0×10^9
		Infes.	472.0×10^3	248.0×10^6	983.0×10^6	193.0×10^7	29.0×10^9	182.0×10^9

storage conditions. However, the average number of storage fungus colonies in the tested grains ranges from 0.5×10^2 to 283×10^9 colonies / gram during storing period. In the cowpea infested by *C. maculatus* the average numbers of fungus colonies increase during storage period from 0.5×10^2 to 10.7×10^3 , from 72×10^2 to 58×10^9 and from 46×10^8 to 28.3×10^9 colonies / gram, at 40 %, 60 %, and 80 % R.H., respectively.

In infested wheat the average numbers of fungus colonies decrease after six months storage from 15.60×10^3 to 3×10^3 , from 105×10^3 to 38×10^3 , and from 472×10^3 to 182×10^9 colonies / gram, under the same storage conditions, respectively, That is, storage of infested cowpea is accompanied by initial heavy attacks by storage fungi which become more vigorous by prolonged storage. On the other hand, the presence of *O. surinamensis* in stored wheat is accompanied by initial vigorous fungal invasion which diminishes by prolonged storage.

Data in Tables (3 - 5) show that the main fungi isolated from infested and noninfested pea or whea, *A. fumigatus*, *A. candidus*, *A. clarate*, *A. niger*, *A. ochraceus*, *A. flavus*, *Penicillium rubrum*, *m. rubrum* are the most common species in all experiments.

DISCUSSION

Results of the present study revealed that the cowpea weevil, *Callosobruchus maculatus*, and the saw-toothed grain beetle, *Oryzaephilus surinamensis*, contribute varying quantities of moisture to the grain in which they develop. The presence of cowpea weevil, in pea raised the moisture content of the infested grain as compared to the noninfested one (Check). The increase was greater at the higher relative humidity (60 %), than at the lower one (40 %). This is due to the increased activity, development, and increase of the population of insects in the pea stored at 60 % R.H. than those kept at 40 % R.H.

On the other hand, the presence of the saw-toothed grain beetle and its propagation on wheat was usually accompanied by relatively slight increase in the moisture content of the infested wheat. This is due to the feeding behaviour of the insect which feeds on broken wheat as well as on developing fungi (Abdel - Rahman *et al.*, 1969). This fact might explain the coincidence of increased storage fungi with higher moisture content of the cowpea rather than the infested wheat.

The moisture content of the tested infested grains, stored at 80 % R.H. remained

Table 3
 Number and kinds of storage fungi from cowpea infested with *Oryzaephilus surinamensis* L.,
 stored at 40 % R.H. and 25 ± 1°C.

Storage Fungi	Status of grain	percentage colonies / gram cowpea						percentage colonies / gram wheat					
		Months						Months					
		1	2	3	4	5	6	1	2	3	4	5	6
<i>Aspergillus glaucus</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	89.15	16.4	42.8	24.8	40.4	90.4
	Infes.	60.0	0.0	0.0	0.0	0.0	0.0	43.1	3.7	11.8	43.8	50.8	40.15
<i>A. fumigatus</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.3	1.8	34.60	0.3
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	13.8	40.2	20.2	12.4	3.7	0.0
<i>A. candidus</i>	Check	0.0	0.0	03.2	6.0	3.2	0.0	1.6	0.57	35.8	10.0	1.8	1.8
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	13.4	0.49	28.8	1.8	0.0	4.13
<i>A. restrictus</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.86	2.10	14.8	4.8	0.9
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	0.43	0.31	36.4	4.8	0.0	24.8
<i>A. clavate</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.39	0.0	0.0	3.42	0.0
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	0.43	0.0	0.0	0.0	0.0	0.0
<i>A. niger</i>	Check	0.0	0.0	0.0	0.0	33.4	0.0	0.0	0.0	0.0	0.0	0.0	2.10
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>A. ochraceus</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.0	0.0	1.3	1.8
<i>A. flavus</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Infes.	0.0	0.0	0.0	0.0	45.0	30.4	0.0	0.0	0.0	0.0	0.0	0.0
<i>Penicillium rubrum</i>	Check	0.0	0.0	0.0	99.4	0.0	0.0	0.9	52.44	8.7	40.6	12.0	4.16
	Infes.	10.4	27.0	26.0	0.8	20.15	23.0	26.14	44.10	2.8	24.1	32.2	21.1
<i>P. citrinum</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.25	14.5	0.0	8.0	2.4	0.0
	Infes.	9.0	2.9	2.5	0.0	4.0	3.17	2.00	4.08	0.0	3.1	5.0	6.02
<i>Alternaria spp.</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Infes.	20.6	70.1	71.5	0.0	0.0	0.0	0.0	2.12	0.0	0.0	0.0	0.0
<i>Fusarium spp.</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	0.0	0.98	0.34
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.00	0.0

Table 4

number and kinds of storage fungi from cowpea infested with *Callowobruchus maculatus* F., and from wheat infested with *Oryzaephilus surinamensis* L., stored, at 60 % R.H. and $25 \pm 1^{\circ}\text{C}$.

Storage Fungi	Status of grain	Percentage colonies / grm cowpea						Percentage colonies / gram wheat					
		Months						Months					
		1	2	3	4	5	6	1	2	3	4	5	6
<i>Aspergillus glaucus</i>	Check	13.30	0.0	50.00	28.60	4.65	92.00	14.40	60.69	10.8	14.4	44.0	0.0
	Infes.	63.0	23.5	16.70	29.1	5.98	0.00	7.20	7.87	27.9	18.4	20.0	60.3
<i>A. fumigatus</i>	Check	83.30	0.0	47.0	0.90	2.84	0.0	27.19	0.0	15.3	44.3	6.2	10.0
	Infes.	22.71	10.55	53.2	17.5	0.26	0.0	25.61	10.75	3.13	10.6	18.2	92.26
<i>A. candidus</i>	Check	3.40	0.0	0.0	0.0	0.0	0.0	21.91	0.0	0.0	4.1	0.0	0.0
	Infes.	4.39	6.99	0.0	4.4	0.0	0.0	0.34	0.19	9.92	30.10	7.9	4.74
<i>A. restrictus</i>	Check	0.0	0.0	0.0	17.30	0.0	7.40	0.0	0.0	2.5	0.0	0.0	0.0
	Infes.	0.0	45.27	0.0	39.0	93.03	0.0	0.0	0.0	27.0	20.40	10.4	0.0
<i>A. clavate</i>	Check	0.0	0.0	3.0	0.0	0.26	0.26	0.0	0.0	2.5	0.0	0.0	0.0
	Infes.	0.0	0.0	21.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>A. niger</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>A. ochraceus</i>	Check	0.0	0.0	0.0	13.7	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>A. flavus</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Penicillium rubrum</i>	Check	0.0	98.0	0.0	18.3	0.0	0.0	1.5	0.0	9.0	20.0	20.0	6.0
	Infes.	9.9	13.0	0.0	10.0	0.47	70.0	0.45	0.94	12.0	15.0	20.0	14.5
<i>P. citrinum</i>	Check	0.0	2.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	1.2	2.10
	Infes.	0.0	0.58	0.0	0.0	0.0	20.0	0.0	0.0	4.80	50.5	1.0	2.0
<i>Alternaria spp.</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	11.43	0.0	0.0	0.0
<i>Fusarium spp.</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Infes.	0.0	0.0	0.0	0.0	0.0	8.13	0.0	0.0	0.0	0.0	0.0	0.0

Influence of the Cowpea Weevil...

Table 5
 Number and kinds of storage fungi from cowpea infested with *Callosobruchus maculatus* F., and from wheat
 infested with *Oryzaephilus surinamensis* L., stored at 80 % R.H. and 25 ± 1 °C

Storage Fungi	States of grain	Percentage colonies / gram cowpea						Percentage colonies / gram wheat					
		Months						Months					
		1	2	3	4	5	6	1	2	3	4	5	6
<i>Aspergillus glaucus</i>	Check	10.2	6.0	90.4	90.4	16.0	39.0	52.09	53.09	50.0	32.7	46.4	57.6
	Infes.	42.0	26.0	50.4	13.0	14.0	20.0	79.6	44.34	60.0	66.4	50.3	0.0
<i>A. fumigatus</i>	Check	0.0	30.0	3.2	0.0	3.6	0.0	0.0	0.0	0.0	10.05	8.4	10.3
	Infes.	0.0	0.0	3.4	0.0	3.6	0.0	0.0	0.0	0.3	18.0	24.0	0.8
<i>A. candidus</i>	Check	0.0	0.0	0.0	20.59	0.85	0.0	6.1	0.84	0.0	8.9	9.6	0.0
	Infes.	0.0	0.98	4.8	3.0	1.0	6.0	1.7	0.97	13.7	0.8	3.8	12.8
<i>A. restrictus</i>	Check	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Infes.	0.0	0.0	4.5	1.8	2.6	4.2	0.0	0.0	0.0	0.0	0.0	0.0
<i>A. clavate</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	20.8	43.37	50.0	24.5	30.3	20.8
	Infes.	20.0	0.0	2.3	0.0	18.4	5.2	8.2	54.27	23.0	12.5	13.5	9.6
<i>A. niger</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	3.04	1.8	3.20
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
<i>A. ochraceus</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>A. flavus</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Penicillium rubrum</i>	Check	0.0	50.8	0.0	27.5	60.1	50.5	17.0	2.7	0.0	17.01	3.3	6.0
	Infes.	90.0	60.0	30.2	50.3	50.3	58.0	9.0	0.0	3.0	2.3	7.3	14.5
<i>P. citrinum</i>	Check	0.0	10.0	0.0	2.3	20.1	10.3	4.0	0.0	0.0	3.5	0.0	2.1
	Infes.	8.0	13.0	4.2	3.4	10.1	6.3	1.5	0.0	0.0	0.0	0.5	2.0
<i>Alternaria spp.</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<i>Fusarium spp.</i>	Check	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Infes.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

unchanged from the check ones. This is due to the death of insects under such an unfavourable condition.

However, the results indicated a constant and biologically significant association between either the cowpea weevil and saw – toothed grain beetle and certain storage fungi. Experiments carried out at 40 %, 60 %, and 80 % R.H. proved that certain storage fungi develop in both infested and noninfested cowpea or wheat. Dilution cultures indicated that although the developing fungi are of similar kinds, yet they grow more readily and in greater numbers in the infested grains than in the noninfested ones. This result suggests that the tested insects carry the inoculum of fungi on and in their bodies. Besides, they provide fungi with the favourable conditions for development and flourishing.

The majority of storage fungi isolated from pea and wheat, infested or noninfested, during the present study belong to the genera *Aspergillus*, *Penicillium*, *Aeternaria*, and *Fusarium*. Of these, *A. glaucus*, *A. fumigatus* and *Penicillium rubrum* were the most common spp. in all experiments.

The present investigation confirms the findings of Soliman *et al.*, 1974 that the growth and increase of storage fungi do not cease even after the death of insects. Thus, measures against both insects and fungi must be integrated.

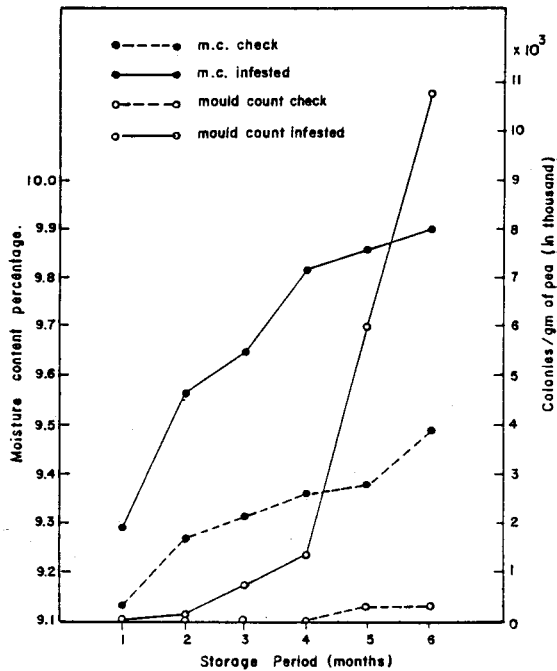


Fig. 1 Relationship between moisture content (40%) and mould count in pea infested with *Callosobruchus maculatus* F.

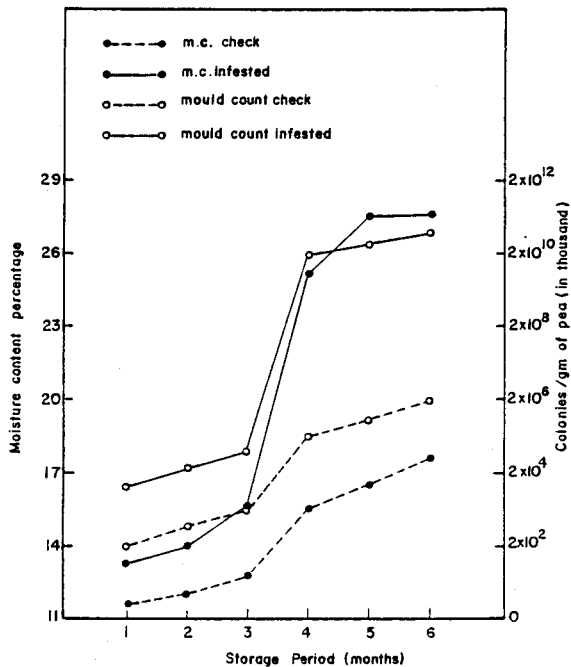


Fig. 2 Relationship between moisture content (60%) and mould count in pea infested with *Callosobruchus maculatus* F.

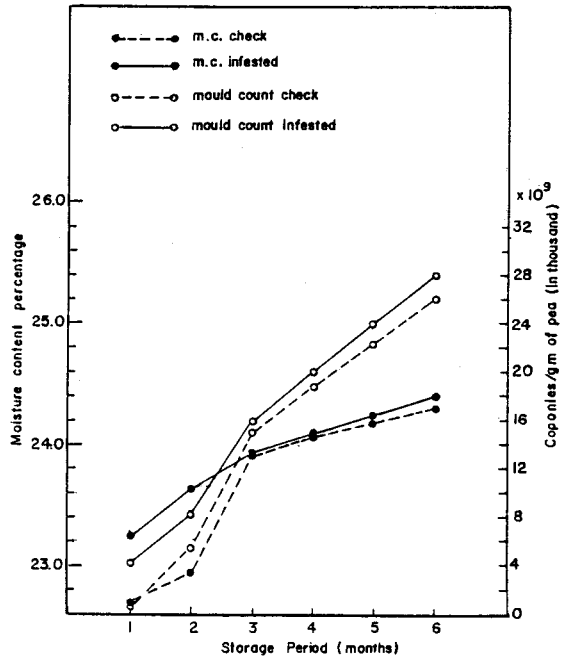


Fig. 3 Relationship between moisture content (80 %) and could count in pea infested with *Callosobruchus maculatus* F.

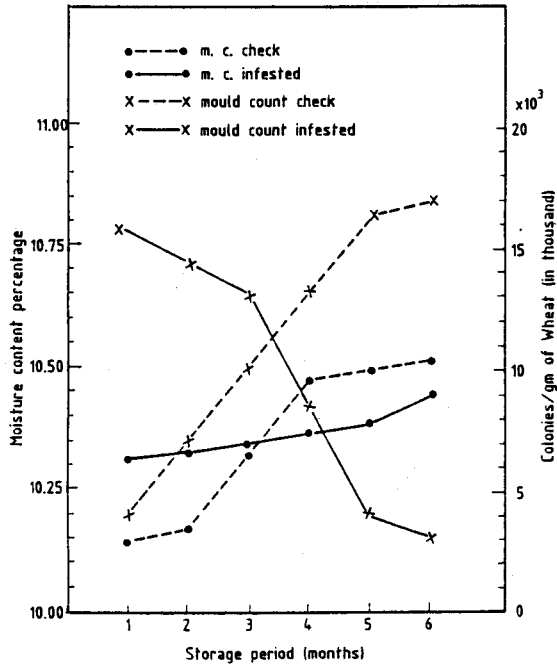


Fig. 4 Relationship between moisture content (40 %) and mould count in wheat infested with *Oryzaephilus surinamensis* L.

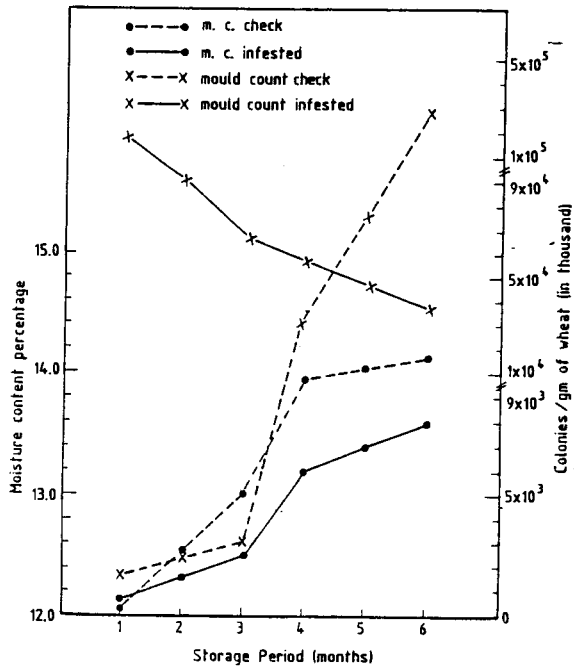


Fig. 5 Relationship between moisture content (60%) and mould count in wheat infested with *Oryzaephilus surinamensis* L.

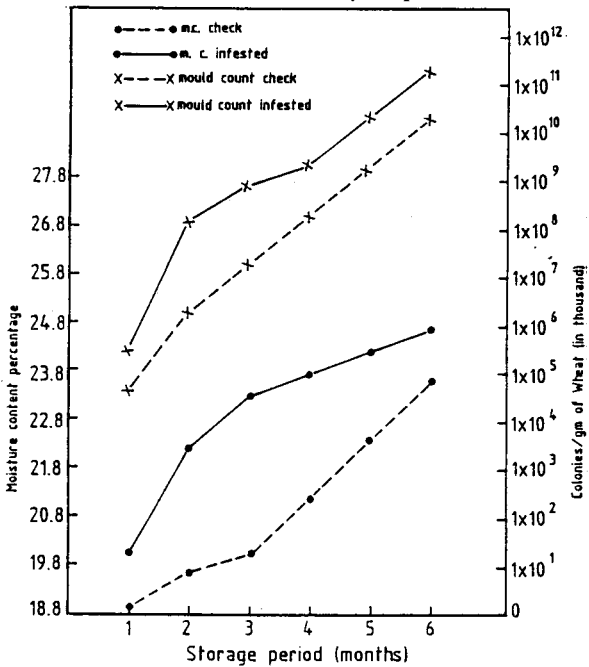


Fig. 6 Relationship between moisture content (80%) and mould count in wheat infested with *Oryzaephilus surinamensis* L.

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تأثير خنفساء اللوبيا وسوسة السيورينام على المحتوى المائي ونمو الفطريات في الحبوب المخزونة

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و

هدى محمد عبد الفتاح

أظهرت النتائج أن إصابة اللوبيا بخنفساء اللوبيا ، والقمح بسوسة السيورينام (السوسة المنشارية) في المخازن ، له تأثير واضح على المحتوى المائي لتلك الحبوب ، وأن معدل الزيادة في هذا المحتوى يتأثر بدرجة الرطوبة النسبية في المخزن ، ولقد صاحب إصابة اللوبيا بخنفساء اللوبيا نمو كبير لبعض الفطريات إزداد ضراوة بإطالة وقت التخزين ، أما سوسة السيورينام فقد صاحبها نمو كثيف لبعض الفطريات في حبوب القمح المخزونة ويقل حدته كلما طال وقت التخزين .

كانت معظم الفطريات التي تم عزلها من كل من الحبوب المصابة أو الخالية من الإصابة تنتمي إلى جنس أسبيرجيللاس ، بنسيليم ، التيرناريا ، وفيوزاريم ، منها أنواع سادت الإصابة وهي : اسبيرجيللاس جلوكس أ . فيوميجاتس ، وبنسيليم روبرم .