

SHORT COMMUNICATION

Insect Pests Associated with Stored Grains in Alexandria Governorate, A.R.E.

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Abstract. In a survey carried out in several grain and grain products stores in Alexandria, 5 lepidopterous insects belonging to 2 families and 10 coleopterous species belonging to 7 families were recorded. The rate of infestation was higher in spring and summer than in autumn and winter, and in the middle layer of grains than in either the surface or the bottom layers.

Introduction

Stored foods, including grain, cereals, cereal products, dried food, nuts, spices, drugs and many others are liable to be infested by a large number of insects, most of which are cosmopolitan and widespread all over the world. According to Metcalf [1], the pests of stored products are the most expensive of all insects, because they feed upon products that have been grown, harvested, sometimes manufactured and stored.

The Coleoptera and Lepidoptera are of prime importance as pests of stored food. Larvae and adults of the former group and only larvae of the latter are doing the damage.

Faunal surveys of insects associated with stored products have been carried out by many authors [1; 2]. The aim of the present work was to survey, identify and determine the rate of infestation with insects associated with grain and grain products, stored in four storage companies in Alexandria governorate.

Materials and Methods

The four storage companies selected for this purpose were the General Company for Silos and Storage (GCSS), the North Alexandria Flour Mills (NAFM), the

South Alexandria Flour Mills (SAFM) and the Alexandria Rice Mills Company (ARMC).

Weekly samples of stored products, 1kg each, were collected randomly from five locations and six store branches for each company. Samples were also collected to represent 3 layers; the surface layer, the middle layer (about 15 cm. deep) and the bottom layer (about 30 cm. deep). This procedure was followed for a complete year, from March 1989 to February 1990, so that 42 weekly samples from each level were taken. Samples for each store were thoroughly mixed and only 1 kilogram of the product was taken for inspection in the laboratory after being sealed in a plastic bag.

Both live and dead adults of the coleoptera and larvae of the Lepidopterous larvae were counted and identified. The extraction procedure [3] was also followed.

The statistical analysis was carried out according to Sokal and Rohlf [4], using WISTAT program, [5]. Which was run on ATARI 1040 ST.

Records of temperature and relative humidity were taken in the different stores.

Results and Discussion

In the present work, 10 insect species belonging to 7 families of the Order Coleoptera, and 5 species belonging to two families of the Order Lepidoptera were recorded and are listed in Table 1. The primary pests included *Rhizopertha dominica*, *Tenebroides mauritanicus*, *Sitophilus* Spp. and *Sitotroga cerealella*.

Data in Table 2, summarize the average number of insects/1 kg of stored products. It is quite clear that relatively higher rates of infestation were observed during spring and summer, while the least rate of infestation was observed during winter. There seems to be a positive correlation between temperature and rates of infestation in wheat, wheat flour and barley rice. Statistically significant values of 0.67, 0.54 and 0.73 were obtained for the correlation coefficients (r) for the above mentioned products. The same conclusion was obtained by several other authors [6-8].

As shown in Table 3 the upper level of stored products harbored the least number of insects (1.03 insect/kg), while the maximum number was observed in samples of the middle layer at the depth of 15 cm. This was common in all inspected stores.

The reason why the middle layer harbored more insects could be explained by the fact that stored products insects usually seek darkness and prefer high temperature [2; 9].

Table 1. Lepidopterous and Coleopterous insect species recorded in stores in Alexandria during the period from March 1989 to February 1990.

Family	Scientific name
	Lepidoptera
Gelechiidae	<i>Sitotroga cerealella</i> Olivier
Pyralidae	<i>Ephestia elutella</i> Hubner
	<i>Ephestia kuehniella</i> Zeller
	<i>Plodia interpunctella</i> Hubner
	<i>Pyralis farinalis</i> L.
	Coleoptera
Bostrichidae	<i>Rhizopertha dominica</i> Fabr.
Trogossitidae	<i>Tenebroides mauritanicus</i> L.
Curculionidae	<i>Sitophilus granarius</i> L.
	<i>Sitophilus oryzae</i> L.
Cucujidae	<i>Oryzaephilus surinamensis</i> L.
Dermestidae	<i>Trogoderma granarium</i> Everst
Ptinidae	<i>Gibbium psylloides</i> deczenpinski
Tenebrionidae	<i>Tribolium confusum</i> Duval
	<i>Tribolium castaneum</i> Herbst
	<i>Tenebrio molitor</i> L.

Table 2. Effect of sampling date on insect population per 1 kilogram of stored product

Stored products and companies	Season				Mean
	Spring	Summer	Autumn	Winter	
Wheat flour					
General Company for Silos and Storage	1.81	1.76	1.23	0.85	1.41
North Alexandria Flour Mills	1.46	1.55	0.99	0.80	1.20
South Alexandria Flour Mills	1.40	1.56	0.96	0.70	1.15
Wheat					
North Alexandria Flour Mills	1.31	1.74	1.02	1.77	1.21
South Alexandria Flour Mills	2.02	2.12	1.64	1.07	1.70
Barley rice					
Alexandria Rice Mills Company	1.12	2.27	1.40	0.62	1.60
Rice					
Alexandria Rice Mills Company	0.82	1.08	0.60	0.58	0.77
Mean	1.30	1.72	1.12	0.77	1.22
Average temp. (°C)	21.90	27.20	24.60	17.12	
Average R.H. (%)	59.00	64.00	62.00	59.00	

Table 3. Average number of insects/kg of products at the 3 levels of inspection

Company	Level			Mean
	(1)	(2)	(3)	
General Company for Silos and Storage	1.08	1.69	1.43	1.40
North Alexandria Flour Mills	1.08	1.37	1.11	1.18
South Alexandria Flour Mills	1.01	1.34	1.06	1.13
North Alexandria Flour Mills	1.02	1.33	1.21	1.18
South Alexandria Flour Mills	1.72	1.93	1.69	1.78
Alexandria Rice Mills Company	1.13	1.37	1.34	1.28
Alexandria Rice Mills Company	0.66	0.94	0.94	0.84
Mean	1.03	1.62	1.25	

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الآفات الحشرية المرتبطة بالمواد المخزونة في محافظة الإسكندرية، ج. م. ع.

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ملخص البحث. تم حصر وتسجيل الحشرات المرتبطة بالمواد المخزونة، وقد شمل الحصر ست وحدات مختلفة لكل شركة من شركات تخزين الحبوب في شرق ووسط وغرب مدينة الإسكندرية وذلك بأخذ عينات عشوائية من ثلاثة مستويات مختلفة منها. وقد سجل وجود خمس حشرات من رتبة حرشفية الأجنحة تنتمي إلى فصيلتين بالإضافة إلى عشر حشرات من رتبة غمدية الأجنحة تنتمي إلى 7 فصائل. وكان معدل الإصابة مرتفعاً في الربيع والصيف عنه في الخريف والشتاء وفي المستوى الأوسط عن المستويين السطحي أو السفلي.