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ECOLOGICAL STUDIES ON THE HOUSE FLIES IN QALUOBIYA GOVERNORATE EGYPT

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ABSTRACT

Fly densities were estimated in four selected localities of Qaluobiya Governorate using sticky traps. Flies could be collected during all months of the year, however, population densities were fluctuating. Maximum and Minimum fly abundance occurred at approximately the same time at all sampling localities. *Musca domestica* was the most common fly species in both urban and rural areas of the Governorate. The distribution of fly population between outdoor and indoor sites was also studied.

INTRODUCTION

The sparseness of ecological studies on the house of flies under field conditions is shocking in view of the important role played by these insects in disease transmission especially in a country like Egypt where all conditions whether sanitary or environmental provide every possible and thinkable facility for the propagation of the flies and the prevalence of the different diseases transmitted by flies.

This study was conducted as a background for other studies aimed at a better understanding of the role of house flies in disease transmission in Qaluobiya Governorate.

MATERIAL AND METHODS

Indoor and outdoor densities of fly population were measured on a monthly basis using standard sticky traps (Spiralette fly catcher,Zobele, Trento) placed swinged for 24 hours at each of the following sampling districts.

- **Ezbet El-Sook:** this is relatively a highly crowded area characterized by the presence of big markets where fresh rotting food and vegetables co-exist. Garbage disposal was irregular; piles of decaying material and animal excrements were almost constantly present in the streets.
- **Ezbet El-Salakhana:** Area with low sanitary conditions. Sewage and garbage removal systems were absent. A slaughterhouse is located in the area. Due to the lack of cleaning water system, wastes of the slaughterhouse (blood, remnant of the slaughtered animals dung) were left exposed around the place.
- **Shoubra El-Khema:** Inspite of encountering certain agricultural sites, this area now is considered as a part of the greater Cairo. Accordingly, it may represent rural, urbanized and urban characters.

Faculty of Science [Benha City]: It represent an area with relatively high sanitation.

The species composition of flies were determined in two districts (Benha city and Ezbet El-salakhana) representing urban and rural areas of the Governorate. A net, 50 cm in diameter, was directed to fly concentration foci and sweeped 5 times, leaving one minute between each sweep. Collected flies were introduced into a wooden cage (30x30x30 cm)by inverting the net inside the cage. Flies were killed by putting the cages in a deep freezer (-20°C) for 10 minutes, then the flies were collected in petri dishes,examined , identified and counted using the key proposed by Shoukry (1984).

RESULTS AND DISCUSSION

Fly density

On the basis of the number of trapped flies using sticky traps (tables, 1&2), the obtained results indicated that house fly population is abundant all the year round. Nevertheless, the population fluctuated within different months of the same season . The seasonal fluctuating in temperature, relative which may be explained by the fact humidity (table,3) and other physical and biotic factors, sanitary conditions as well as the intensive application of insecticides, during certain periods of the year, for combating insect pests may also be of considerable importance in this respect. The highest population densities were observed during the moderate temperature of March, April, May and October. The low population densities of flies occurred during June, July and August may be due to the effect of high temperature on immature stages rather than adult insects that it causes rapid desiccation of the breeding media. These findings run parallel to what have been found by early investigators as Hafez (1941 a and b) ; Holway et al., (1951 a and b) Madwar and Zahar, (1951 and 1953). However, these findings are useful in updating our knowledge about this subject.

In most sampling districts, more flies were collected at outdoor locations during November-April. On the other hand, more flies were collected at indoor locations during June-September. During May and October, fly population were distributed between outdoor and indoor locations. The tendency of a large percentage of flies to move inside of

Table (1): Number of flies collected from Ezbet El-Sook and Shoubra El-Khema districts, Qaloubiya Governorate, (Jan.-Dec., 1988) using sticky traps.

District	Average number of files collected/trap ± S.D					
	Ezbet El-Sook			Shoubra El-Khema		
Months	Outdoor	Indoor	Total	Outdoor	Indoor	Total
January	4.3±0.94 (71.7)	1.7±0.94 (28.3)	6.0 (5.25)	2.3 ,1.25 (69.7)	1.0±0.82 (30.3)	3.3 (3.4)
Feb.	6.3±2.87 (78.8)	1.7 ,0.47 (21.2)	8.0 (7.0)	3.0±0.82 (63.8)	1.7±0.47 (36.2)	4.7 (4.8)
March	13.0±5.35 (78.8)	2.6 ,1.25 (21.2)	15.6 (13.7)	7.7±2.87 (70.0)	3.3±0.47 (30.0)	11.0 (11.2)
April	10.7±1.7 (64.1)	6.0±0.82 (35.9)	16.7 (14.6)	6.7±1.7 (52.7)	6.0±1.41 (47.3)	12.7 (13.0)
May	7.3±2.05 (57.9)	5.3±0.47 (42.1)	12.6 (11.0)	6.3±1.7 (47.4)	7.3±1.25 (52.6)	13.6 (13.9)
June	1.0±0.82 (14.9)	5.7±0.47 (85.1)	6.7 (5.9)	1.3±1.25 (13.5)	2.3±2.56 (86.5)	9.6 (9.8)
July	1.3±1.25 (16.3)	6.0 ,2.05 (83.7)	7.3 (6.4)	1.0±0.82 (21.3)	3.7±1.89 (78.7)	4.7 (4.8)
August	1.0±0.8 (13.7)	6.3 ,1.25 (86.3)	7.3 (6.4)	1.3±0.47 (24.5)	4.0±0.82 (75.5)	5.3 (5.4)
Sept.	2.3±0.94 (50.0)	2.3 ,0.47 (50.0)	4.6 (4.0)	1.7±0.94 (26.6)	4.7±0.47 (73.4)	6.4 (6.5)
October	7.0±2.94 (46.7)	8.0 ,1.63 (53.3)	15.0 (13.1)	5.3±1.25 (46.9)	6.0±3.27 (73.4)	11.3 (11.5)
Nov.	9.7± 1.7 (78.2)	2.7 ,2.49 (21.8)	12.4 (10.9)	6.0±0.82 (64.5)	3.3 ,2.87 (35.5)	9.3 (9.5)
Dec.	1.3±1.53 (65.0)	0.7±0.94 (35.0)	2.0 (1.8)	3.7±1.25 (61.7)	2.3 ,2.05 (38.3)	6.0 (6.1)

The numbers between brackets denote the precentage values

Table (2): Number of flies collected from Ezbet El-Salakhana and Faculty of Science districts; Qaloubiya Governorate, (Jan.-Dec., 1988) using sticky traps.

District	Average number of files collected/trap ± S.D					
	Ezbet El-Sook			Shoubra El-Khema		
Months	Outdoor	Indoor	Total	Outdoor	Indoor	Total
January	6.0±1.41 (58.3)	4.3±0.47 (41.7)	10.3 (7.7)	00.00 (0.0)	2.7±2.05 (100.0)	2.7 (7.0)
Feb.	2.3±2.05 (66.0)	0±0.82 (30.3)	3.3 (2.5)	00.00 (0.0)	1.3±0.47 (100.0)	1.3 (3.4)
March	3.3±2.05 (67.9)	1.7±1.25 (34.0)	5.0 (3.7)	2.3 1.7 (50.0)	2.3±1.25 (50.0)	4.6 (11.9)
April	5.7±1.5 (67.9)	2.7±0.47 (32.1)	8.4 (6.3)	3.0 1.63 (81.1)	0.7±0.94 (18.9)	3.7 (9.6)
May	9.0±1.4 (43.5)	11.7±4.99 (56.5)	20.7 (15.5)	00.00 (0.0)	4.3±1.7 (100.0)	4.3 (11.1)
June	4.0±1.25 (36.4)	7.0±0.47 (63.6)	11.0 (8.2)	00.00 (0.0)	3.3±2.62 (100.0)	3.3 (8.5)
July	1.0±1.41 (8.3)	11.0±1.63 (91.7)	12.0 (9.0)	00.00 (0.0)	3.0±2.45 (100.0)	3.0 (7.8)
August	1.3±1.25 (17.1)	6.3±2.49 (82.9)	7.6 (5.7)	00.00 (0.0)	1.3±1.25 (100.0)	1.3 (3.4)
Sept.	3.0±0.82 (25.6)	8.7±4.03 (74.4)	11.7 (8.8)	1.0±0.82 (50.0)	1.0±1.41 (50.0)	2.0 (5.2)
October	6.7±2.36 (62.6)	4.0±2.16 (37.4)	10.7 (8.0)	1.7±0.47 (100.0)	00.00 (0.0)	1.7 (4.4)
Nov.	13.3±5.44 (73.9)	4.7±2.05 (26.1)	18.0 (13.5)	2.7±1.25 (54.0)	2.3±0.94 (46.0)	5.0 (13.0)
Dec.	8.3±1.25 (55.3)	6.7±2.05 (44.7)	15.0 (11.2)	0.7±0.47 (12.3)	5.0±2.94 (87.7)	5.7 (14.8)

The numbers between brackets denote the precentage values

houses during most months of the year to avoid unfavorable conditions outside is of considerable importance from the epidemiological point of view. Microorganisms associated with these flies may contaminate human food through faeces and/or vomit spots. It may be also concluded that, the high abundance of flies observed in the study area is mainly due to the waste and garbage disposal problem in the area.

Species composition of flies

Results of the present work (table,4) clearly indicated that *Musca domestica* is the most common and abundant fly species in both rural and urban areas. It represented 90.17% and 84% of the flies collected from Benha city and Ezbet El-Salakhana village respectively.

The rural areas of Ezbet El-Salakhana (main-slaughterhouse) had higher densities of *Calliphora, Sarcophaga, Fannia* and *Stomoxys calcitrans* than Benha City. This may be due to the abundance of suitable breeding media and/or hosts for these fly species in rural areas.

Table (3) Seasonal variation of temperature and relative humidity of Qaluobiya Governorate (Jan.-Dec., 1988).

Months	Temperature°C			R.H.%
	Outdoor	Indoor	Average	
January	18.8	17.5	17.0	70.5
February	16.1	14.7	15.4	65.7
March	19.4	18.1	18.8	60.7
April	26.0	24.0	25.0	57.3
May	23.7	24.1	23.9	58.2
June	28.0	26.0	27.0	55.6
July	31.6	9.7	30.7	45.2
August	33.4	31.0	32.2	61.0
September	30.2	28.0	29.1	63.7
October	28.0	26.2	27.1	62.8
November	22.0	20.0	21.0	67.5
December	20.5	18.2	19.4	69.5

Table (4): Species composition of the collected fly samples at 2 indicator areas of Qaluobiya Governorate (Jan. Dec., 1988) using sweep net.

Fly species	Benha city		Ezbet El-Salakhana	
	Average No. collected ±S.D.	%	Average No. collected ±S.D.	%
Musca domestica	178.10±47.50	90.17	207.40± 71.70	84.00
Musca sorbens	1.78 ± 1.70	0.90	1.36± 1.45	0.55
Stomoxys calcitrans	0.22 ± 0.23	0.11	3.70 ±0.68	0.30
Fannia spp.	0.25 ± 0.29	0.13	1.44± 1.60	0.58
Sarcophaga spp.	0.19 ± 0.20	0.10	0.58± 0.60	0.23
Calliphora spp.	0.41 ± 0.75	0.21	1.92 ±2.48	0.78
Others*	16.57 ± 13.40	8.39	33.50± 27.10	13.60

*: Most of these flies belong to Family Muscidae

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