

SURVEY AND FLUCTUATION OF CERTAIN FLY SPECIES CAUGHT BY BAITED TRAPS IN SOME ANIMAL AND POULTRY FARMS AT SHARKIA GOVERNORATE

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ABSTRACT: Adult flies were collected using bait traps in four different animal and poultry farms at Sharkia governorate east Delta, Egypt, from July,2001 to June, 2002. A total of 53900 flies were collected, and identified which represented by 14 species, 11 genera and 7 families. Cow stable ranked the first position by 36.82% of the total caught flies. Family Muscidae was the most dominant one (69.7% of flies) and included the highest number of species (5 species) compared to the other caught families. *Musca domestica* was the most dominant species in both animal and poultry farms(68.58%) followed by *Drosophila repleta* (28.97%), *M. tempestiva* (1.1%) and *Chrysomyia albiceps* (0.68%).

Key words: survey, flies, animal and poultry farms, fluctuation.

INTRODUCTION

The dipterous flies are among the most important insects that affect human and comfort of domestic and wild animals, which most frequently as nuisances, occasionally as vectors of pathogenic organisms. Livestock

and wild life are at greater risk of attack by myiasis-causing flies than are people. (Patton & Evans 1930; and Zumpt, 1973), (Mullen & Durden 2002).

The majority species breed in carrion, cadavers, excrement, decaying vegetable matters, dung heaps, poultry manure, or other types of filth, from which they

may carry pathogens to human food or drinks, or directly to the human body or attack animals (Büsvine, 1951 and Smart, 1965).

The present investigation focused on the collection and identification of flies found in different animal and poultry farms at Sharkia Governorate. These studies may throw a beam of light on the most dominant species and population dynamics of medical and veterinary importance of certain flies to human and animals.

MATERIALS AND METHODS

Survey of Adult Flies Caught by Baited Traps in Animal and Poultry Farms:

Studies on surveying the adult flies which occur in animal and poultry farms were carried out at Zagazig and Hahia districts, Sharkia Governorate, Egypt, during one year from July, 7th, 2001 until June, 30th, 2002.

In this respect four different animal and poultry farms namely, cow stable, buffalo stable, rabbitry farm and poultry farm were selected.

Five types of bait traps were employed for collecting the adult flies from each of the four locations. The first is 100g. of a

paste form consisted of wheat-bran, milk powder, brewer's yeast and tap water (150g., 50g., 3g. and 240ml respectively) were placed in one of the trap, the second is 100g. of skimmed white cheese, the third is 100g. of minced meat, the fourth is 100g. of putrid Nile fish, the fifth is 100g. of boiled eggs.

A trap of every type of bait was set up at every one of the four locations for one day once weekly.

Flies samples were transferred into the laboratory and killed by chloroform 10% and then separated and counted into different species by the aid of a binocular stereomicroscope. Flies were identified by Department of Zoology, Faculty of Science, Zagazig University and Plant Protection Research Institute, Dokki, Egypt.

Records of the Meteorological station at Zagazig region were taken to represent the prevailing condition during the whole period of this study. The simple correlation and partial regression values were calculated according to Fisher (1950) and Snedecor (1957).

RESULTS AND DISCUSSION

1- Survey of Flies Occurring in Animal and Poultry Farms:

Survey of flies occurring in animal and poultry farms by using bait traps at Sharkia Governorate from July, 2001 to June, 2002 were undertaken. The fly species surveyed were as adult stage. The approximate period of abundance of all caught species was recorded, and illustrated in Table (1).

The results displayed in Table (1) showed that the whole total number of 53900 flies represented by 7 families, 11 genera and 14 species, which were collected. Identification of the captured species, includes *Musca domestica* L. 68.58%, *Drosophila repleta* Wollaston 28.97%, *M. tempestiva* Fallen 1.1%, *Chrysomya albiceps* Wiedemann 0.68% and other species represented by 0.67%.

The Muscidae species which captured included the most dominant species, which was *M. domestica* and ranked the first position among other total species of this family. In the second position came *M. tempestiva*.

Synthesiomya nudiseta (Van der Wulp) amounted 0.03% and ranked the third position between Muscidae species.

M. albina Wiedemann followed by *Muscina stabulans* (Fall.) and each represented only by 0.01%.

Species of family Drosophilidae could be arranged descendingly according to their abundance during the whole period of study as follows: *D. repleta*, *Scaptomyza graminum* (Fallen), *D. melanogaster* Meigen, their percentages were 28.97, 0.31 and 0.13% respectively.

The catch number of *C. albiceps* reached 370 individuals and occupied the first position of species of Calliphoridae, where *Lucilia cuprina* Wiedemann amounted 27 individuals.

Family Phoridae, represented only by one species which is *Megaselia scalaris* (Loew) and occupied the seventh position among all fly species and represented by 0.11%.

Physiphora smaragdina (Loew) came after *Megaselia scalaris* (Loew) in abundant and amounted 0.02%. This species belong to family Otitidae.

Piophilha casei (Linnaeus) represented by very low percentage, 0.005% and belong to family Piophilidae.

The species of *Pegomya hyoscyam* (Panzer) ranked the last position among all the previously mentioned species, its percentage was 0.003%. These results are in partially agreement with those of

Table (1) Occurrence adult flies captured in animal stables at Zagazig district, Sharkia Governorate, Egypt from July 2001 to June 2002.

Family	Species	Approximate period of abundance		Total	%
		From	to		
Muscidae	<i>Musca domestica</i> L.	Jul.	June	36970	68.58
	<i>Musca tempestita</i> Fallen	Apr.	May	567	1.10
	<i>Synthesiomya nudiseta</i> (Van der Wulp)	Mar.	Aug.	19	0.03
	<i>Musca albina</i> Wiedemann	Jul.	Aug.	8	0.01
	<i>Muscina stabulans</i> (Fall.)	May	Jun.	7	0.01
Drosophilidae	<i>Drosophila repleta</i> Wollaston	Jul.	Jun.	15617	28.97
	<i>Scaptomyza graminum</i> (Fallen)	Oct.	Jun.	167	0.31
	<i>Drosophila melanogaster</i> Meigen	Aug.	Mar.	69	0.13
Calliphoridae	<i>Chrysomya albiceps</i> Wiedemann	Mar.	Nov.	370	0.68
	<i>Lucilia cuprina</i> Wiedemann	May	Aug.	27	0.05
Phoridae	<i>Megaselia scalaris</i> (Loew)	Apr.	May	61	0.11
Otitidae	<i>Physiphora smaragdina</i> (Loew)	Feb.	May	13	0.02
Piophilidae	<i>Piophila casei</i> (Linnaeus)	Aug.	-	3	0.005
Anthomyiidae	<i>Pegomya hyoscyam</i> (Panzer)	Aug.	-	2	0.003
				53900	

Bai and Sankaran (1982) in India, who surveyed 9 species of flies (in the genera *Musca*, *Chrysomya* and *Physiphora*) from cattle, pig and poultry manure. Kelany *et al* (1983) conducted study on survey of flies in Zagazig region, Egypt, and they found 8 species but the more abundant fly species were *M. domestica vicina*, *Physiphora demandata* and *Chrysomya albiceps*. Park and Jo (1984) surveyed 39 species of Diptera included *Lucilia sericata*, *M. domestica* and *Muscina stabulans* which formed over 50% of the catches flies. Farkas and Papp (1989) indicated that during a survey flies in Hungary, found 15 species (including *M. domestica*, *Muscina stabulans* and *Drosophila repleta*). Demény (1989) made a survey of flies in Hungary. The majority of the 21 species of Diptera were including *M. domestica* and *Muscina stabulans*. Park and Jo (1989) surveyed 44 species of flies in Korea. Calliphoridae were most commonly caught (64% of the total), followed by Muscidae (31%). Ebejer and Gatt (1999) surveyed 17 species of Muscidae in Maltese Islands (including *Synthesiomya nudiseta* and *M. tempestiva*). Such data mentioned

above are in general relatively agreed with the present findings recorded during this experiments.

2- The Relationship between the Collected Species of Flies and Type of Farm:-

The results obtained in Table (2) showed that maximum captured population of adult flies caught at the cow stable and which was the more density. The highest percentage of flies trapped being (36.82%), and the lowest percentage (17.75%) occurred at the buffalo stable, where the population fly densities at the poultry and rabbitry farm were represented by 24.58% and 20.85%, respectively.

The common house fly, *M. domestica* was found in the cow stable, poultry farm, buffalo stable and rabbitry farm represented by total numbers; 18589, 11971, 5898 and 512 respectively. The second dominant species, *D. repleta* was found in the rabbitry farm, buffalo stable, poultry farm and cow stable represented by the following total numbers; 10672, 3591, 987 and 367 respectively. According to abundance of captured fly species, *M. tempestiva* at different locations, the cow stable was the first one, followed by rabbitry,

Table (2) Numbers of certain dominant fly species collected from different animal premises at Zagazig district, Sharkia Governorate, Egypt from July 2001 to June 2002 using different food material.

Family	Cow stable	Buffalo stable	Poultry farm	Rabbitry farm	Total
1- Fam: Muscidae					
<i>Musca domestica</i>	18589	5898	11971	512	36970
<i>Musca tempestiva</i>	511	2	23	31	567
<i>Synthesiomya nudtesta</i>	14	0	4	1	19
<i>Musca albina</i>	1	0	7	0	8
<i>Muscina stabulans</i>	5	0	0	2	7
2- Fam: Drosophilidae					
<i>Drosophila repleta</i>	367	3591	987	10672	15617
<i>Scaptomyza graminum</i>	87	18	57	5	167
<i>Drosophila melanogaster</i>	23	45	1	0	69
3- Fam: Calliphoridae					
<i>Chrysomya albiceps</i>	214	0	151	5	370
<i>Lucilia cuprina</i>	27	0	0	0	27
4- Fam: Phoridae					
<i>Megaselia scalaris</i>	4	1	43	13	61
5- Fam: Otitidae					
<i>Physiphora smaragdina</i>	0	11	1	1	13
6- Fam: Piophilidae					
<i>Piophila casei</i>	0	0	3	0	3
7- Fam: Anthomyiidae					
<i>Pegomya hyoscyam</i>	2	0	0	0	2
Total	19844	9566	13248	11242	53900
%	36.82	17.75	24.58	20.85	
Significant level	A	D	B	C	

L S D 5% =217.69**

poultry farm and buffalo stable, respectively.

C. albiceps ranked the fourth position and found in 3 locations which could be arranged descendingly as follow: cow stable, poultry and rabbitry farm, which represented with total numbers; 214, 151 and 5 flies, respectively.

Scaptomyza graminum occupied the fifth position in 4 locations and were arranged descendingly as follow: cow stable, poultry farm, buffalo stable and rabbitry farm respectively.

Kelany *et al* (1983) surveyed flies in different animal and poultry farms, and they found that the highest numbers of captured adult flies were in horse stable, fowl shed, sheep shed, duckling and cow stable, respectively. Rueda *et al* (1990) made a survey of filth flies in 14 poultry farms in Philippines and found that the dominant species was *M. domestica* followed by, *C. megacephala* in all farms surveyed. The rest species in the present work were *D. melanogaster*, *Megaselia scalaris*, *L. cuprina*, *Synthesiomya nudiseta*, *Physiphora smaragdina*, *M. albina*, *Muscina stabulans*,

Piophilha casei and *Pegomya hyoscyma* which were found in low numbers and represented by 0.13, 0.11, 0.05, 0.03, 0.02, 0.01, 0.01, 0.005 and 0.003% respectively during this period of study.

3- Population Fluctuation of More Dominant Fly Species:

Population fluctuation of the more two dominant species were studied and its results were illustrated in Tables (3-6).

3.A- *Musca domestica*:

This species was the most abundant species represented by 68.58% flies Table (1). *M. domestica* was the dominant species in cow stable, poultry farm, buffalo stable and rabbitry farm represented by 94.45, 91.32, 62.16 and 4.57%, respectively.

Concerning its fluctuation in Tables (3-6) such species reached a highest number during July, 2001 (5870) and June, 2002 (4049) in cow stable, July,2001 (1398) and June, 2002 (2170) in buffalo stable and July, 2001 (82) and June, 2002 (218) in rabbitry farm, while in poultry farm such densities were found in July and August, 2001 (4956, 2483 flies, respectively) Table (5). The population was

Table (3) Population fluctuation of dominant fly species captured from cow stable at Zagazig district, Sharkia Governorate, Egypt from July 2001 to June 2002.

Months	Fam: Muscidae		Fam: Drosophilidae	Fam: Calliphoridae
	<i>Musca domestica</i>	<i>Musca tempestiva</i>	<i>Drosophila repleta</i>	<i>Chrysomya albiceps</i>
Jul. 2001	5870	0	0	7
Aug.	2238	0	1	9
Sep.	2266	0	2	2
Oct.	1322	0	5	2
Nov.	753	0	3	2
Dec.	114	0	0	0
Jan. 2002	1	0	0	0
Feb.	0	0	0	0
Mar.	1	0	3	0
Apr.	145	3	308	4
May	1830	147	44	138
Jun.	4049	361	1	50
Total	18589	511	367	214
Mean	1549.1	42.6	30.6	17.8
%	94.45	2.6	1.86	1.09
Significant level	A	B	B	B

LSD 5% =698.5**

Table (4) Population fluctuation of dominant fly species captured from buffalo stable at Zagazig district, Sharkia Governorate, Egypt from July 2001 to June 2002.

Months	Fam: Muscidae	Fam: Drosophilidae
	<i>Musca domestica</i>	<i>Drosophila repleta</i>
Jul. 2001	1398	934
Aug.	741	99
Sep.	484	12
Oct.	114	415
Nov.	15	165
Dec.	0	46
Jan. 2002	0	16
Feb.	0	30
Mar.	6	341
Apr.	419	834
May	551	271
Jun.	2170	428
Total	5898	3591
Mean	491.5	299.3
%	62.16	37.84
Significant level	A	AB

LSD 5% =306.4**

Table (5) Population fluctuation of dominant fly species captured from poultry farm at Zagazig district, Sharkia Governorate, Egypt from July 2001 to June 2002.

Months	Fam: Muscidae	Fam: Drosophilidae	Fam: Calliphoridae
	<i>Musca domestica</i>	<i>Drosophila repleta</i>	<i>Chrysomyia albiceps</i>
Jul. 2001	4956	3	20
Aug.	2483	0	10
Sep.	1805	18	112
Oct.	710	4	3
Nov.	1329	0	6
Dec.	232	0	0
Jan. 2002	3	1	0
Feb.	1	0	0
Mar.	51	73	0
Apr.	299	859	0
May	2	26	0
Jun.	100	3	0
Total	11971	987	151
Mean	999.6	82.2	12.6
%	91.32	7.53	1.15
Significant level	A	B	B

LSD 5% = 505.5**

Table (6) Population fluctuation of dominant fly species captured from rabbitry farm at Zagazig district, Sharkia Governorate, Egypt from July 2001 to June 2002.

Months	Fam: Muscidae		Fam: Drosophilidae
	<i>Musca domestica</i>	<i>Musca tempestiva</i>	<i>Drosophila repleta</i>
Jul. 2001	82	0	759
Aug.	74	0	99
Sep.	6	0	15
Oct.	14	0	416
Nov.	4	0	21
Dec.	16	0	4
Jan. 2002	0	0	1123
Feb.	0	0	1086
Mar.	7	0	702
Apr.	61	10	4497
May	30	2	731
Jun.	218	19	1219
Total	512	31	10672
Mean	42.7	2.6	8893
%	4.57	0.28	95.15
Significant level	B	B	A

LSD 5% = 448**

decreased until reach its lowest numbers during December, 2001, January, February and March, 2002 in all examined animal and poultry farms Tables (3-6). The obtained results are in agreement with those reported by, Paul *et al* (1983), which made survey study for Diptera in 2 market places, an abattoir and municipal rubbish tip in India and they found 10 species of Muscidae in which *M. domestica* was the dominant species. Kelany *et al* (1983) reported that common house fly *M. domestica vicina* was the most abundant species at all five tested locations at Sharkia Governorate. Rueda *et al* (1990) reported survey about filth flies in 14 poultry farms at Philippines and they showed that *M. domestica* was the commonest species on all farms surveyed. Nichita *et al* (2000) found that the most frequent species was *M. domestica* throughout the summer in pig and cattle shelters. Liu *et al* (2003) conducted a survey in China. The

predominant species were *M. domestica* and *Lucilia sericata*.

Statistical analysis of some climatic factors (Temperature °C and R.H.%) showed a positive and highly significant correlation coefficients between the mean

temperature and population density of *M. domestica* table (7) where $r = 0.685^{**}$. In case of the relative humidity, there was no significant value was registered.

3.B- *Drosophila repleta*:

This species was the second dominant fly species, where the total numbers represented by 28.97% of the whole dipterous catch in this study, Table (1). *D. repleta* represented by the following numbers (95.15, 37.84, 7.53 and 1.86%) in rabbitry farm, buffalo stable, poultry farm and cow stable respectively.

Regarding to the fluctuation of *D. repleta* Tables (3-6) showed that the highest number of individuals (4497, 859 and 308 flies) were in April, 2002 in rabbitry farm, poultry farm and cow stable respectively. On the other hand, in buffalo stable the number of caught flies reached its maximum in July (934, Table 4). The population size in the four tested farms showed that total flies population of rabbitry farm was the highest one followed by buffalo stable, poultry farm and cow stable respectively. From other point of view number of flies were fluctuated and decreased in lowest number during November

Table (7) Correlation coefficient between population of dominant fly species and both of temperature and relative humidity and their interactions.

Species	Temperature	Relative humidity	Interaction between Temp. and R. H.	E.V. %
<i>M. domestica</i>	0.685 **	0.156 n. s.	0.056*	47%
<i>D. repleta</i>	- 0.097 n. s.	- 0.446 n. s.	0.366 n. s.	20%
<i>M. tempestiva</i>	0.279 n. s.	- 0.524 n. s.	0.101 n. s.	39%
<i>C. albiceps</i>	0.237 n. s.	- 0.632*	0.043*	50%

till February in all animal and poultry farms except rabbitry farm. Greenberg (1973), Harrington and Axtell (1994) stated that flies of Drosophilidae are generally harmless, some species (especially *D. repleta*) are a potential means for mechanical transmission of pathogens when they breed in animal faces. Farkas and Papp (1989) made a survey of flies in manure and feed refuse in a caged-layer house of a co-operative farm in Hungary. They found 15 species (including *M. domestica*, *Muscina stabulans* and *D. repleta*).

Statistical analysis of some climatic factors (Temperature °C and R.H.%) indicated a negative non-significant correlation coefficients between the population and both mean of temperature and relative humidity Table (7). It is clear that temperature and relative humidity influenced the counted flies which represented by 20% (E.V.%) Table (7).

The other dominant species of flies were *M. tempestiva* and *C. albiceps*, their population counts are represented by 2.57 and 0.27% in cow stable and rabbitry farm in case of the first species Tables (3, 6), while were 1.13 and 1.07% in the second species, in poultry

farm and cow stable, respectively Tables (3, 5)

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حصر و تذبذب بعض أنواع الذباب باستخدام مصائد غذائية فى بعض مزارع الإنتاج الحيوانى و الدواجن فى محافظة الشرقية

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أجرى هذا البحث بهدف الحصول على نتائج عن حصر الأطوار الكاملة للذباب المنتشر فى بعض مزارع الإنتاج الحيوانى، حيث تم اصطياد الذباب باستخدام المصائد الغذائية المطعومة بمواد غذائية معينة فى ٤ مزارع مختلفة و هى (مزرعة الأبقار؛ مزرعة الجاموس؛ مزرعة الدواجن؛ مزرعة الأرنجب) فى محافظة الشرقية، شرق الدلتا، مصر خلال الفترة من يوليو ٢٠٠١ إلى يونيو ٢٠٠٢. بلغ التعداد الكلى للذباب ٥٣٩٠٠ ذبابة تتبع ١٤ نوع، ١١ جنس و ٧ فصائل و قد تم تعريف هذه الأنواع. سجل أعلى تعداد للذباب فى مزرعة الأبقار بنسبة (٣٦,٨٢% من تعداد الكلى). كانت أكثر الفصائل سيادة هى فصيلة *Muscidae* بنسبة (٦٩,٧%) حيث شتملت على أعلى تعداد من الأنواع (٥ أنواع) مقارنة بفصائل الأخرى. وجد أن أكثر الأنواع سيادة هى *Musca domestica* (٦٨,٥٨%) يليها *Drosophila repleta* (٢٨,٩٧%) ثم *M. tempestiva* (١,١%) وأخيرا *Chrysomya albiceps* (٠,٦٨%).