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Prevalence of dipterous flies with veterinary importance in selected sheep's farms and slaughter houses in Jazan, Saudi Arabia

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ABSTRACT

A survey for Dipterous flies was conducted in 3 private sheep's' farms and 3 governmental slaughter houses at Abu Arish, Alquayiyah, (Eastern Jazan); Duhaygah and Mihliyah (Northern Jazan); Mizhirah and Industrial City (Southern Jazan). Each locality was visited weekly to collect the flies using aerial sweeping net. A total of 5312 specimens consisting of 12 species, 1 subspecies within 8 genera, belonging to 7 families: Calliphoridae, Sarcophagidae, Muscidae, Ceratopogonidae, Utilidae, Sphaeroceridae, and Chloropidae were recorded. Among the total flies collected in all localities *Coproica vegans* (Haliday) was the most abundant species followed by *Anatricus erianceus* Loew and they represented 72.74% and 21.71% of the total collection, respectively. On the other hand, *Culicoides imicola* Kieffer, *Sarcophaga ruficornis* (Fabricius) and *Musca lucidula* (Loew) were recorded in few numbers and they represented 0.09%- 0.1% of the total collection. *Physiphora alceae* (Preyssler) and *Musca sorbens* Wiedemann were recorded only from slaughter houses. In addtion, *Sarcophaga dux* Thompson is recorded for the first time from Jazan during the present investigation. For accurate location of sampling sites, details of the selected area such as longitude, latitude and altitude were computed using the global positioning system (GPS).

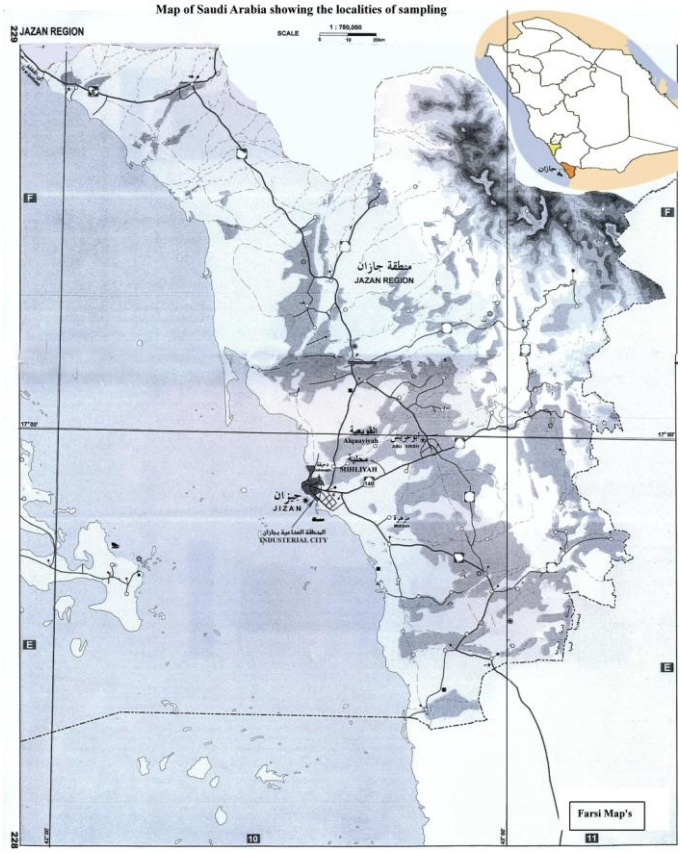
Keywords: Jazan; Diptera; Calliphoridae, Sarcophagidae, Muscidae, Ceratopogonidae, Utiltidae, GPS, longitude, latitude, altitude

INTRODUCTION

Jazan region, occupying an area of about 40,000 km^2, and it stretches along the coastline of the Red Sea. Public services and facilities of the region help establishing minor industries, mainly in fields of agriculture and livestock, which correspond with the rational significance of Jazan region. Moreover, livestock especially sheep are considered as the main source of animal proteins in Jazan**.** Ministry of Agriculture gave several reports on a variety of infectious and noninfectious diseases which affect the economic production of livestock, but with very little attention to the vectors transmit or cause these diseases. Although Dipterous flies are the most important arthropod vectors of animal diseases causing severe economic losses (Mellor *et al*., 2000; Heath 2002; Williams, 2009; and Barin *et al*., 2010), only some information on the occurrence of these flies in Jazan region are included in separated investigations that carried out by Hilali *et al*. (2003), and Dawah and Abdullah (2006). Accordingly, the present study aimed to establish the prevalence of dipterous flies associated with sheep's in Jazan.

MATERIAL AND METHODS

The survey of flies was conducted in 3 private sheep's' farms and 3 governmental slaughter houses (Fig.1) at Abu Arish (16°58'N-42°47'E), Alquayiyah, (16°58'N-42°49'E) (East of Jazan); Duhaygah (16°56'N-42°38'E) and Mihliyah (16°55'N-42°36'E) (North of Jazan); Mizhirah (16°49'N-42°38'E) and Industrial City (16°49'N-42°43'E) (South of Jazan).



Survey period extended from January (the coldest month) to June (the hottest month) 2010, during which each locality was visited weekly to collect the flies using aerial sweeping net (Hilali *et al*., 2003). A total of 144 insect collections were carried out from all the selected farms and slaughter houses. The collected flies were killed by chilling them at -20°C for 25-30 minutes. Small flies were identified, counted, recorded and then preserved in 70% ethanol and glycerin. Specimens were identified by using keys of Sabrosky's (1951), Hennig (1955-64), Shaumar *et al*., (1989), Borkent and Wirth (1997), and Pape (1998). For conformation of species identification some specimens were sent to the faculty of Science, Cairo University, to compare with type specimens in the Reference Collection. The nomenclatures of species are updated depending on the annual checklist database of Evenhuis *et al*. (2008).

For accurate location of sampling sites, details of these localities such as longitude, latitude and altitude (Table 1) were computed using the global positioning system (GPS, Trex Vista® HCx). Ecological data including, temperature, relative humidity, pressure, wind velocity and rainfall rate were obtained from the Department of Meteorology, Jazan (Table 2). For statistical analysis ANOVA was done (SAS, 1987).

Table 1: GPS data of the surveyed farms and slaughter houses

Areas		Number sheep	GPS data		
			Elevation	Location	
				N	E
Eastern Jazan	*Alquayiyah	90	66	16 58.573	42º 49.645
	**Abu Arish	450	89	16 58.182	42º 47.567
Northern Jazan	*Duhaygah	85	42	16 56.209	42º 38.363
	**Mihliyah	150	22	16 55.967	42º 36.407
Southern Jazan	*Mizhirah	130	11	16 49.087	42º 83.722
	**Industrial City	250	10	16 49.190	42º 43.291

*Farms, ** Slaughter houses

Table (2): Monthly climatic parameters recorded at the study localities

Areas	Month	Temperature			Relative Humidity%			Pressure (hla)			Wind	Rainfall(mm
		Max	Min.	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Mean speed (kt)	
Abu Arish	Jan.	32.0	21.2	27.0	74	51	66	1014.2	1011.3	1012.8	03	-
	Feb.	29.8	23.0	27.0	81	51	60	1013.4	1009.7	1011.4	06	9.0
	Mar.	33.3	25.4	29.1	69	59	64	1012.4	1009.0	1010.7	06	-
	Apr.	36.0	29.0	31.9	75	54	63	1009.1	1003.6	1006.2	07	-
	May	36.6	29.2	32.3	75	56	69	1006.8	1003.7	1005.1	05	-
	Jun.	39.0	29.0	33.3	76	43	62	1005.8	1001.6	1004.1	05	-
Alquayiyah	Jan.	32.0	21.0	26.8	81	40	68	1015.4	1011.5	1009.6	04	-
	Feb.	31.0	23.0	26.5	81	64	74	1009.7	1006.5	1007.8	05	8.0
	Mar.	33.0	24.0	29.4	79	52	65	1009.8	1006.2	1007.8	07	-
	Apr.	34.0	27.0	30.7	69	45	59	1007.7	1004.5	1005.8	06	-
	May	36.5	29.3	32.1	77	50	67	1006.0	1002.2	1004.1	06	-
	Jun.	38.0	29.9	32.8	79	40	65	1005.5	1002.3	1003.9	06	-
Mihliyah	Jan.	31.4	26.6	27.5	81	60	72	1014.1	1010.9	1012.3	04	-
	Feb.	31.8	24.0	27.5	83	60	73	1014.5	1010.1	1011.8	04	7.0
	Mar.	33.6	26.0	29.5	68	55	64	1013.1	1009.8	1011.3	06	-
	Apr.	37.0	29.0	32.8	77	43	63	1009.2	1003.3	1006.4	06	-
	May	37.0	29.7	33.3	76	42	62	1008.0	1003.7	1005.7	07	-
	Jun.	38.0	29.6	33.6	77	50	67	1006.1	1002.4	1004.5	05	-
Duhaygah	Jan.	31.0	25.0	27.7	79	62	72	1014.3	1010.4	1012.2	03	-
	Feb.	30.6	24.0	27.5	82	60	72	1015.0	1010.8	1012.6	05	5.0
	Mar.	32.6	25.0	29.2	80	56	69	1013.9	1009.9	1011.8	04	-
	Apr.	37.7	29.0	33.1	82	37	58	1009.7	1006.0	1007.6	06	-
	May	36.0	30.8	32.8	77	52	63	1008.0	1003.5	1005.8	06	-
	Jun.	37.7	30.0	33.6	72	39	52	1006.4	1004.6	1005.4	04	-
Industrial City	Jan.	30.8	24.0	27.7	79	57	70	1014.9	1011.7	1013.2	04	-
	Feb.	32.0	23.5	27.5	80	61	72	1016.1	1012.1	1013.6	06	9.0
	Mar.	33.7	26.0	29.4	78	53	68	1014.9	1010.8	1012.6	05	-
	Apr.	38.5	29.6	33.8	77	47	67	1010.2	1006.7	1008.3	05	-
	May	37.4	29.0	33.1	71	40	59	1008.3	1004.2	1006.1	05	-
	Jun.	38.0	31.0	34.5	69	31	53	1006.5	1001.7	1004.6	06	-
Mizhirah	Jan.	31.9	24.8	27.9	78	53	70	1015.0	1011.2	1013.2	04	-
	Feb.	31.0	24.7	27.3	79	66	79	1016.2	1012.4	1013.9	06	9.0
	Mar.	32.8	23.0	27.8	76	52	64	1015.2	1011.6	1013.2	06	-
	Apr.	39.8	29.0	34.8	78	46	64	1011.0	1008.0	1009.6	04	-
	May	37.0	30.0	33.5	72	59	65	1006.7	1002.9	1009.6	05	-
	Jun.	38.6	30.0	34.3	75	47	64	1006.4	1003.2	1005.0	05	-

RESULTS AND DISCUSSION

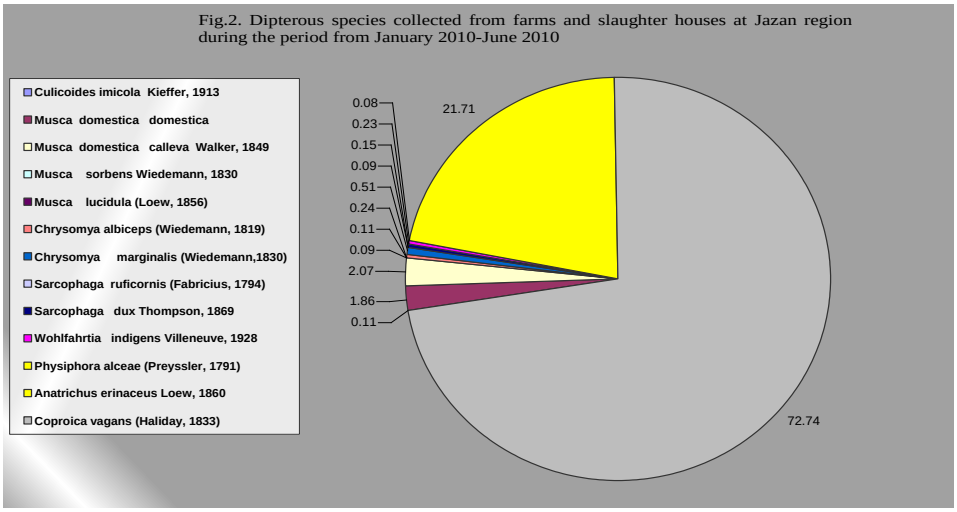
The results of this study revealed that, 5312 flies, Fig 2 (2180 from farms, Fig.3 and 3132 from slaughter houses, Fig. 4) belonging to 12 species, 1 subspecies, 8 genera and 7 families: Calliphoridae, Sarcophagidae, Muscidae, Ceratopogonidae, Utilidae, Sphaeroceridae, and Chloropidae were recorded (Table, 3). According to their importance to livestock, the flies were categorized into the following groups: 1) flies causing myiasis, *Chrysomya albiceps* (Wiedemann), *Chrysomya marginalis* (Wiedemann), *Sarcophaga ruficornis* (Fabricius), *Sarcophaga dux* Thompson, and *Wohlfahrtia indigens* Villeneuve; 2) haemtophagous flies, *Musca lucidula* (Loew), and *Culicoides imicola* Kieffer; 3) dung decomposing flies, *Physiphora alceae* (Preyssler), *Anatrichus erianceus* Loew, and *Coproica vegans* (Haliday); 4) non-biting Muscid flies (*Musca domestica* Linnaeus, *Musca domestica calleva* Walker and *Musca sorbens* Wiedemann) that visit manure and decaying organic material

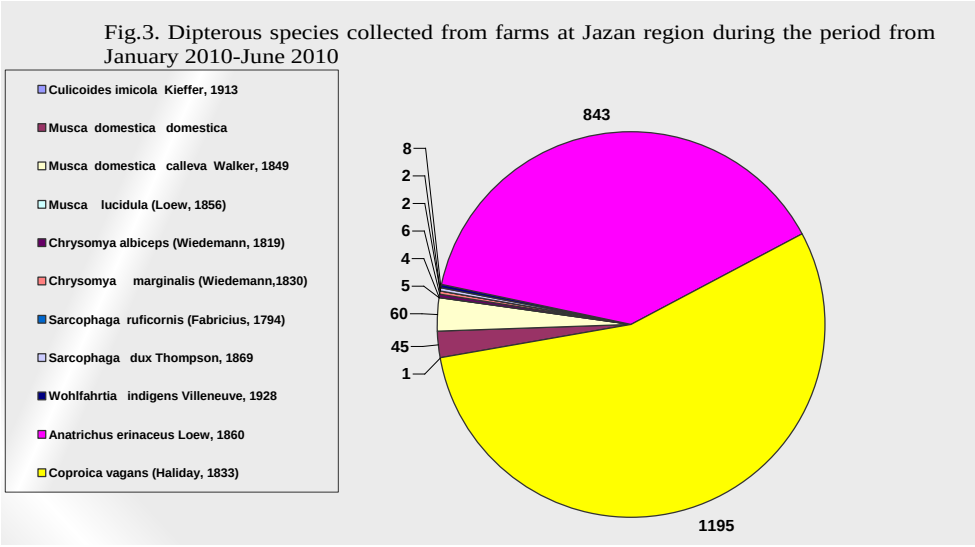
to feed and oviposit. Muscid flies are also act as biological or mechanical vectors of pathogens (Graczyk *et al*., 1999; Fischer *et al*., 2001; Muhammad and Ludeck 2004).

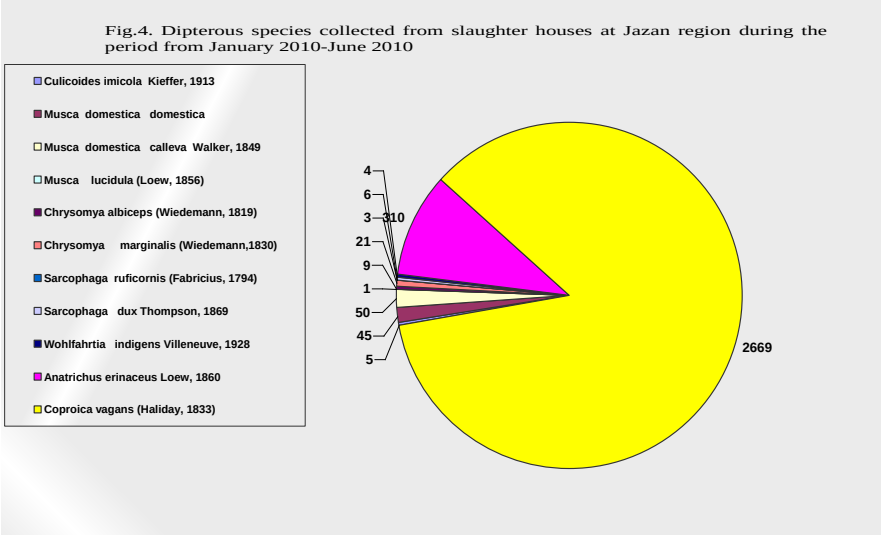
Among the total insect collections (Table 3, Fig. 2) *Coproica vegans* was the most abundant species and it represented 72.74% of the total collection, followed by *Anatricus erianceus* (21.71%), *Musca domestica calleva* Walker (2. 07%) and *Musca domestica* (1.86 %).

Table 3: Dipterous species collected from farms and slaughter houses at Jazan region during the period from January 2010-June 2010

Collected species				Farms	Slaughter houses	Total No	%
Nematocera		Ceratopogonidae	*Culicoides imicola* Kieffer, 1913	1	5	6	0.11
Brachycera	Acalyptrate	Muscidae	*Musca domestica* Linnaeus, 1758	54	45	99	1.86
			Musca domestica calleva Walker, 1849	60	50	110	2.07
			Musca sorbens Wiedemann, 1830	0	5	5	0.09
			Musca lucidula (Loew, 1856)	5	1	6	0.11
		Calliphoridae	*Chrysomya albiceps* (Wiedemann, 1819)	4	9	13	0.24
			Chrysomya marginalis (Wiedemann,1830)	6	21	27	0.51
		Sarcophagidae	*Sarcophaga ruficornis* (Fabricius, 1794)	2	3	5	0.09
			Sarcophaga dux Thompson, 1869	2	6	8	0.15
			Wohlfahrtia indigens Villeneuve, 1928	8	4	12	0.23
	Calyptrate	Ulidiidae	*Physiphora alceae* (Preyssler, 1791)	0	4	4	0.08
		Chloropidae	*Anatrichus erinaceus* Loew, 1860	843	310	1153	21.71
		Sphaeroceridae	*Coproica vagans* (Haliday, 1833)	1195	2669	3864	72.74
TOTAL				2180	3132	5312	







The high density populations of *Coproica vegans* and *Anatrichus erianceus* have a considerable nuisance value that cause annoyance and may reduce feeding, leading to reduction in animal productivity. On the other hand, *Sarcophaga ruficornis* and *Musca lucidula* were encountered in few numbers (5- 6 flies) in farms, as well as in slaughter houses. The nematoceran biting midges *Culicoides imicola*, the main field vector of AHSV (African horse sickness virus) and BTV (blue tongue virus) in Saudi Arabia (Lane, 1983 and Mellor *et al*., 2000), was collected from Mizhirah, Mihliyah and Industrial City. It was reported previously in Saudi Arabia from Riyadh (Boorman, 1989; Alahmed and Kheir, 2005) and from Abha, Jazan and Al Kharj (Hilali *et al*., 2003). The coprophagous fly *Physiphora alceae*, and face fly *Musca sorbens* were recorded only from slaughter houses by the respective numbers 4 and 5 flies. In addition, *Sarcophaga dux* is record from Jazan (Southern Saudi Arabia) for the first time during this investigation, while it was reported earlier from Jeddah western Saudi Arabia by Gadallah and Bosly (2006).

As show in Table (3) the captured eye fly *Anatricus erianceus* (Chloropidae) was significantly higher in number (P< 0.5) at farms than at slaughter houses where 843, 310 flies were recorded, respectively. This might be attributed to the comparatively high number of sheep at slaughter houses (150-450 sheep, Table 1) and also to the flies' habit of being attracted to eyes to feed on lachrymal secretions and other body fluids of various animals (Chansang and Mulla, 2008). On the other hand, the spherocerid dung flies *Coproica vegans* was significantly higher in number (P< 0.5) at slaughter houses than at farms where 2669 and 1195 flies were recorded, respectively. The presence of dung in large amount in slaughter houses without removing for long periods may explain this result.

Concerning the monthly abundance of flies at both farms and slaughter houses, Table (6) elucidated that, flies are more abundant at the coldest months January and February where the temperature is more favorable and average minimum and maximum temperatures are 21^{o}C and 32^{o}C, respectively; meanwhile the least number of flies were recorded at the hottest month June which has average minimum and maximum temperatures of 29^{o}C and 39^{o}C, respectively. The same finding was obtained by Al-Sheikh *et al.* (2000), and the adverse effects of high temperature on adult survival can explain these results (Hunt *et al*., 1989; and Wittman and Baylis, 2000).

Comparing the abundance of *Anatricus erianceus* and *Coproica vegans* at farms and slaughter houses showed that: at farms (Table 4) *Anatricus erianceus* was more abundant at Alquayiyah (Eastern Jazan) followed by Duhaygah (Northern Jazan), then Mizhirah (Southern Jazan). On the other hand, *Coproica vegans* was more abundant at Duhaygah (Northern Jazan) followed by Mizhirah (Southern Jazan), then Alquayiyah (Eastern Jazan). Meanwhile, at slaughter houses (Table 5) *Anatricus erianceus* as well as *Coproica vegans* were more abundant at Abu Arish (Eastern Jazan) followed by Mihliyah (Northern Jazan) then Industrial City (Southern Jazan).

These results elucidated that the two species are more abundant at Eastern region followed by Northern then Southern region. Data in Tables (1, 2, 4 & 5) showed that there is a relation between the number of recorded flies and elevation of the region, but intensive ecological studies are required to give an appropriate interpretation for this observation. Regarding monthly abundance, *Anatricus erianceus* and *Coproica vegans* have different patterns of abundance at farms (Figs. 5 & 6) and slaughter houses (Figs. 7 & 8).

These differences in abundance patterns might be due to the integrated effects of more than one factors such as sheep number, weather parameters, and also presence of natural enemies in the surveyed localities (Mendes and Linhares, 2002).

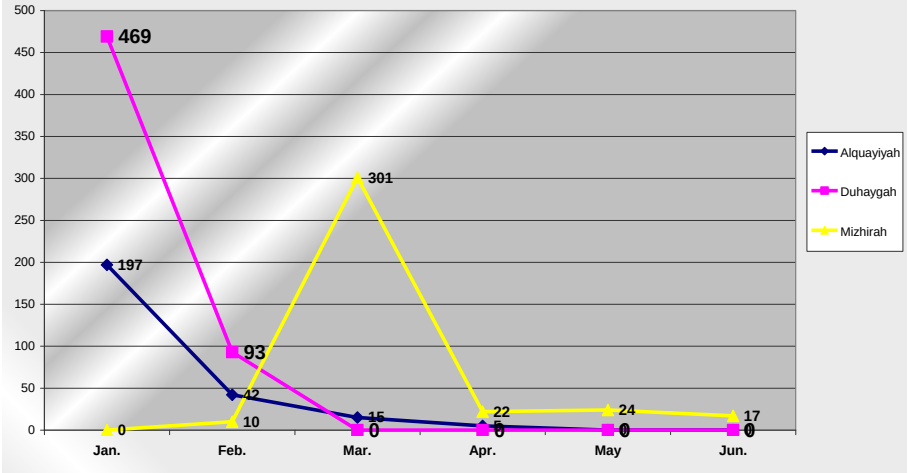
Table (4): Monthly abundance of flies collected from sheep's farms at Alquayiyah (Eastern Jazan); Duhaygah (Northern Jazan); Mizhirah (Southern Jazan) during the period from January-June 2010

Species	Areas	Jan.	Feb.	Mar.	Apr.	May	Jun.	Total
Musca domestica	Alquayiyah	9	7	4	2	3	2	27
	Duhaygah	2	4	2	1	1	2	12
	Mizhirah	5	3	2	2	1	2	15
Musca domestica calleva	Alquayiyah	4	5	3	1	1	1	15
	Duhaygah	10	6	4	2	2	1	25
	Mizhirah	6	5	2	3	2	2	20
Musca lucidula	Alquayiyah	4	1	0	0	0	0	5
	Duhaygah	0	0	0	0	0	0	0
	Mizhirah	0	0	0	0	0	0	0
Chrysomya albiceps	Alquayiyah	2	0	0	0	0	0	2
	Duhaygah	0	2	0	0	0	0	2
	Mizhirah	0	0	0	0	0	0	0
Chrysomya marginalis	Alquayiyah	4	1	0	0	0	0	5
	Duhaygah	0	0	0	0	0	0	0
	Mizhirah	0	0	1	0	0	0	1
Sarcophaga ruficornis	Alquayiyah	0	0	0	0	0	0	0
	Duhaygah	0	0	0	0	0	2	2
	Mizhirah	0	0	0	0	0	0	0
Sarcophaga dux	Alquayiyah	0	1	0	0	0	0	1
	Duhaygah	0	0	0	0	0	0	0
	Mizhirah	1	0	0	0	0	0	1
Wohlfahrtia indigens	Alquayiyah	1	1	0	0	2	0	4
	Duhaygah	0	0	0	0	1	2	3
	Mizhirah	1	0	0	0	0	0	1
Anatrichus erianceus	Alquayiyah	50	215	218	45	30	27	585
	Duhaygah	72	65	0	0	0	0	137
	Mizhirah	0	3	32	65	12	9	121
Coproica vagans	Alquayiyah	197	42	15	5	0	0	259
	Duhaygah	469	93	0	0	0	0	562
	Mizhirah	0	10	301	22	24	17	374
Culicoides imicola	Alquayiyah	0	0	0	0	0	0	0
	Duhaygah	0	0	0	0	0	0	0
	Mizhirah	1	0	0	0	0	0	1
Total		838	464	584	148	79	67	2180

Table 5: Monthly abundance of flies collected from slaughter houses at Abu Arish (Eastern Jazan); Mihliyah (Northern Jazan); Industrial City (Southern Jazan) during the period from January-June 2010

Species	Areas	Jan.	Feb.	Mar.	Apr.	May	Jun.	Total
Musca domestica	Abu Arish	3	2	3	2	2	2	14
	Mihliyah	3	2	1	1	3	1	11
	Industrial City	6	5	1	4	2	2	20
Musca domestica calleva	Abu Arish	5	3	2	2	1	1	14
	Mihliyah	3	4	3	2	2	1	15
	Industrial City	7	4	3	3	3	1	21
Musca lucidula	Abu Arish	0	1	0	0	0	0	1
	Mihliyah	0	0	0	0	0	0	0
	Industrial City	0	0	0	0	0	0	0
Musca sorbens	Abu Arish	0	0	0	5	0	0	5
	Mihliyah	0	0	0	0	0	0	0
	Industrial City	0	0	0	0	0	0	0
Chrysomya albiceps	Abu Arish	2	0	0	0	0	1	3
	Mihliyah	0	1	0	0	0	0	1
	Industrial City	3	2	0	0	0	0	5
Chrysomya marginalis	Abu Arish	10	2	0	0	0	0	12
	Mihliyah	0	0	0	0	0	0	0
	Industrial City	9	0	0	0	0	0	9
Sarcophaga ruficornis	Abu Arish	0	0	0	0	0	0	0
	Mihliyah	0	0	0	0	1	1	2
	Industrial City	0	0	0	0	0	1	1
Sarcophaga dux	Abu Arish	1	1	0	0	1	0	3
	Mihliyah	0	0	0	0	0	0	0
	Industrial City	1	0	2	0	0	0	3
Wohlfahrtia indigens	Abu Arish	0	1	0	0	0	0	1
	Mihliyah	0	0	0	0	0	0	0
	Industrial City	3	0	0	0	0	0	3
Physiphora alceae	Abu Arish	0	0	0	0	0	0	0
	Mihliyah	0	0	0	0	0	0	0
	Industrial City	1	0	3	0	0	0	4
Anatrichus erianceus	Abu Arish	69	0	0	33	15	10	127
	Mihliyah	36	79	0	0	0	0	115
	Industrial City	0	5	23	18	12	10	68
Coproica vagans	Abu Arish	466	802	0	0	0	0	1268
	Mihliyah	608	471	0	0	0	0	1079
	Industrial City	0	6	113	121	59	23	322
Culicoides imicola	Abu Arish	0	0	0	0	0	0	0
	Mihliyah	0	1	0	0	1	0	2
	Industrial City	3	0	0	0	0	0	3
Total		1239	1392	154	191	102	54	3132

Fig.5. Monthly abundance of *Coproica vagans* collected from sheep's farms at Alquayiyah (Eastern Jazan); Duhaygah (Northern Jazan); Mizhirah (Southern Jazan) during the period from January-June 2010



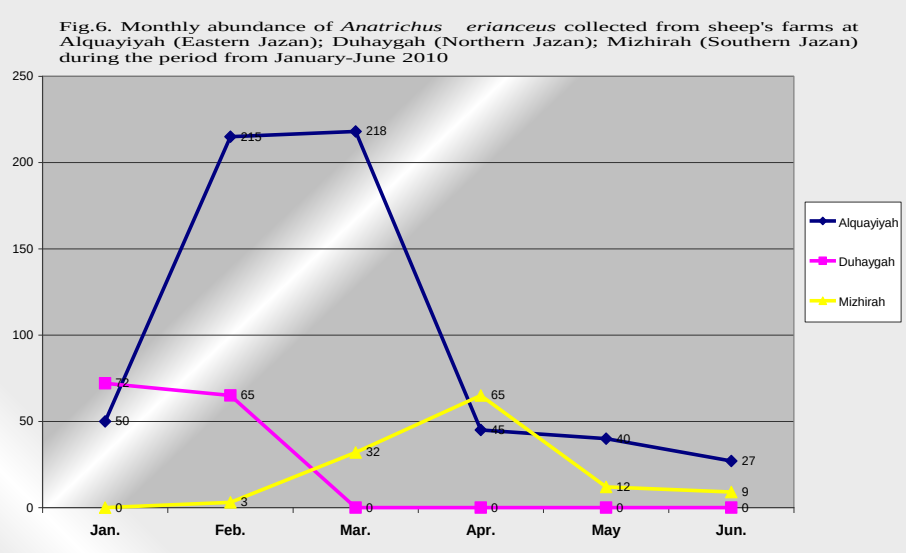


Table (6) Monthly number of the encountered flies from all study localities at Jazan region during the period from January 2010-June 2010

Collected species	Jan.	Feb.	Mar.	Apr.	May	Jun.
Culicoides imicola	4	1	0	0	1	0
Musca domestica domestica	28	23	13	12	12	11
Musca domestica calleva	35	27	17	13	11	7
Musca sorbens	0	0	0	5	0	0
Musca lucidula	4	2	0	0	0	0
Chrysomya albiceps	7	5	0	0	0	1
Chrysomya *marginalis*	23	3	1	0	0	0
Sarcophaga ruficornis	0	0	0	0	1	4
Sarcophaga dux	3	2	2	0	1	0
Wohlfahrtia indigens	5	2	0	0	3	2
Physiphora alceae	1	0	3	0	0	0
Anatrichus erinaceus	227	367	273	161	69	56
Coproica vagans	1740	1424	429	148	83	40
Total	2077	1856	738	339	181	121

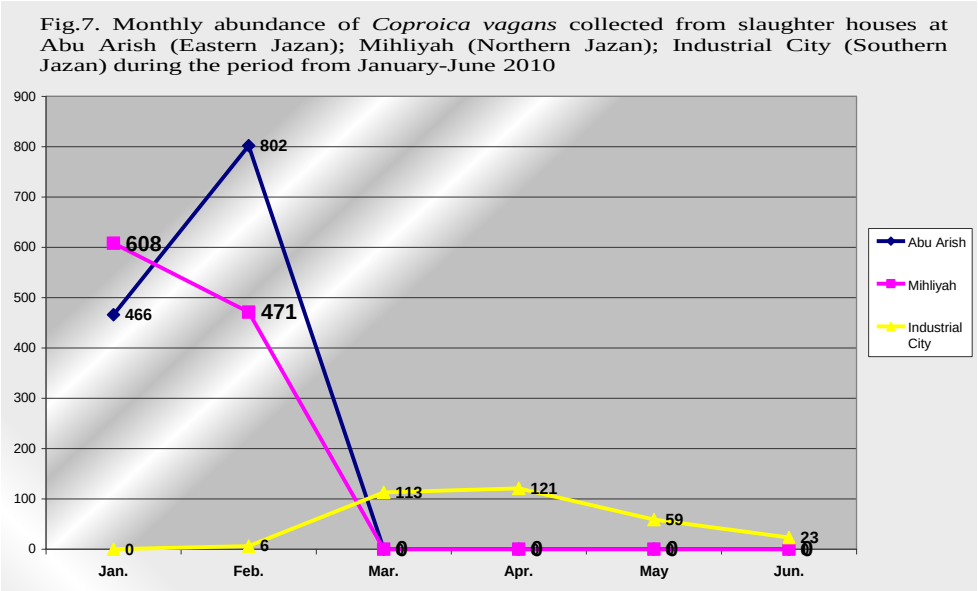
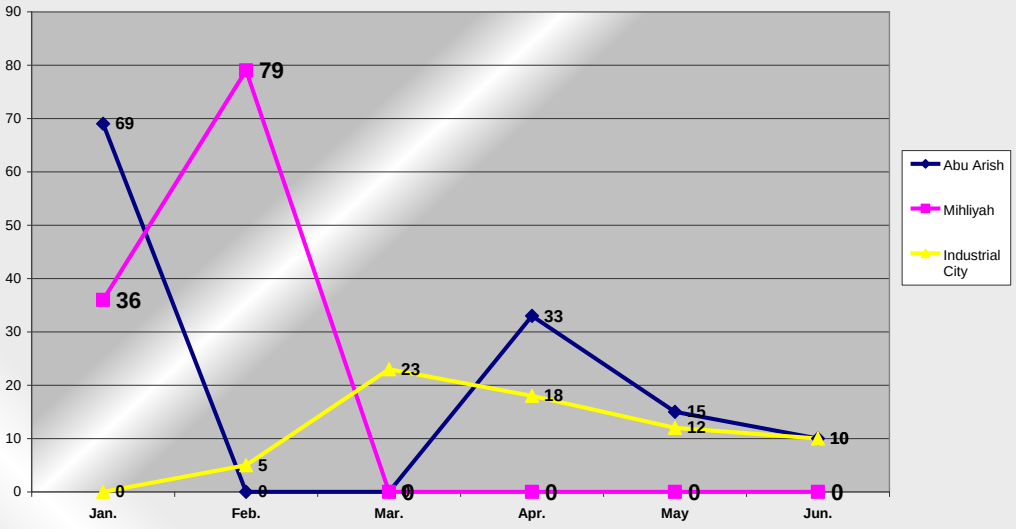


Fig.8. Monthly abundance of *Anatrichus erianceus* collected from slaughter houses at Abu Arish (Eastern Jazan); Mihliyah (Northern Jazan); Industrial City (Southern Jazan) during the period from January-June 2010



CONCLUSION

Although the number of sphaerocerid and chloropid flies caught in this study was relatively high, but there was no great diversity in species composition. This might be due to some limitations in the types of traps used for collection. Also, the number of recorded species, especially biting midges expected to increase if further collections are made using light traps stationed at many points of animals' pens and slaughter houses.

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ARABIC SUMMARY

تواجد الذباب ثنائى الأجنحة ذوالأهمية البيطرية في بعض مزارع ومسالخ الأغنام في منطقة جازان ، المملكة العربية السعودية

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تعتبر الأغنام المصدر الرئيسي للبروتين الحيواني في منطقة جازان . و قد قامت وزارة الزراعة فى السنوات الأخيرة بتقديم عدة تقارير عن عدد من أمراض الماشية المعدية والمؤثرة على الثروة الحيوانية فى جازان ، ولكنها لم تشر فى تلك التقارير لناقلات أو مسببات هذه الأمراض بالدرجة الكافية . و يعد الذباب التابع لرتبة ثنائية الأجنحة من أهم مفصليات الأرجل الناقلة للأمرض والتى تسبب خسائر اقتصادية كبيرة فى الثروة الحيوانية لذلك فقد أجريت هذه الدراسة بهدف تحديد تواجد الذباب فى الأماكن التي تربى و تتواجد بها الأغنام في منطقة جازان . هذا و قد تم تجميع الذباب بشكل اسبوعي منتظم باستخدام الشبكة الهوائية من 3 مزارع للأغنام علاوة على 3 مسالخ تم اختيارها فى مواقع مختلفة لتغطية معظم أجواء جازان وهى كالتالى : أبو عريش ، القويعية (شرق جازان) ؛ دحيقة ومحلية (شمال جازان) ، والمدينة الصناعية ومزهرة (جنوب جازان). ونظرا لطبيعة الطقس فى منطقة جازان و التى تتميز بوجود فصلين فقط (شتاء و صيف) فقد امتدت مدة حصر الذباب ما بين شهرى يناير (أكثر الشهورانخفاضا فى درجة الحرارة) و يونيو (أكثر الشهور ارتفاعا فى درجة الحرارة). وقد أسفر ذلك الحصر عن تجميع 5312 عينة ذباب مشتملة على 12 نوع، نويع و 8 أجناس تابعة لسبعة فصائل على النحو التالي : فصيلة الذباب الأزرق (Calliphoridae)، فصيلة ذباب اللحم (Sarcophagidae)، فصيلة الذباب الحقيقي (Muscidae)، فصيلة الهاموش الواخز (Ceratopogonidae)، فصيلة ذباب Ulidiidae، فصيلة ذباب الروث الصغرى (Sphaeroceridae)، فصيلة ذباب هاموش العيون (Chloropidae). هذا و قد اظهرت الدراسة ان ذباب *كوبرويكا فيجينس* كان النوعَ الأكثر وفرةً يلية النوع *أناتريكس آرينسس* وقد مثل النوعان 72.74 % و21.71 % من العدد الكلى للذباب، على التوالي . من جهة أخرى فقد تواجدت الأنواع : *كيوليكويدس ايميكول*ا، *ساركوفاجا روفيكورنيس*، *ماسكا لوسيدولا* بأعدادٍ قليلة (0.09 %- 0.1% من العدد الكلى للذباب). أما النوعان *ماسكا سوربينس* *فيزى فورا ألسى* فقد تم رصدهما فى المسالخ فقط . علاوة على ذلك فقد تم تسجيل النوع *ساركوفاجا داكس* لأول مرة فى منطقة جازان خلال هذه الدراسة. و الجدير بالذكرأنه تم تسجيل التفاصيل الخاصة بالأماكن محل الدراسة مثل خطِوط الطول وخطوط العرض والإرتفاع عن سطح البحر باستخدام جهاز تحديد المواقع العالمي (GPS جي بي اس) و ذلك لتحديد مواقع تواجد العينات بدقة.