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Prevalence of the medically important flies at Sari Township, Mazandaran province, 2015

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Abstract
The flies due to their type of behavior, nutrition and transmission of autogenic agents in the rural and urban areas are medically important. Identifying the species of the flies and their vector in each region are the first step in managing the control of the insects and preventing the disease. Therefore, the present study is determined to the identification of the flies with the medically important at the Sari Township.
Materials and methods: This cross-sectional study was done in 2015. The adult flies were hunted with hand and using the plastic bottle with inverted opening, fixed with entomology needle and killed in the glass container having the calcium cyanide. In the laboratory the flies were identified to the species level using Krzysztof szpila (2013) and the avail-able descriptions and explanations were used. The gender identification in the Muscidae and calliphoridae families was done referring to the eye distance, but in the sarcophagidae family by observation of the male genital organ at the abdomen end. The descriptive statistic was used in presenting the obtained data.
Results: In all, 3355 flies from three families of Muscidae, caliphoridae and Sarcophagidae were hunted of them 638 were hunted by trap method and 2717 by the net method. From Sarcophagidae family 64 flies were hunted comprising 12(0.36%) and 52 (1.56%) sarcophaga Africa and sarcophaga argyrostama. From the caliphoridae family, in all 406 flies were hunted comprising Lucilia sericata 150 (%4.47); chrsomyia albiceps 180(5.36%); challiphora vicina 76 (2.26%).Of the Muscidae family, in all 2885 flies were hunted, including Musca domestica (76.30%); Muscina stabulans 325(9.69%). Highest prevalence rate of the flies was observed in the months' of June and July (summer)16.43% and 17.58% respectively, but the lowest rate in the months of February and march (winter). In all of the 3355 hunted flies, 1897(56.54%) were female and 1458(43.46%) were male.
Conclusion: In this study, in all 7 medically important species of the flies were hunted. Knowing that the high prevalence of flies is observed in the summer season at the Sari Township, the control of them should be done more attention. For the completion of the data on medically important flies at Sari Township, beside the morphologic methods the molecular methods are recommended.

Keywords: Prevalence, flies, Sari Township, Mazandaran

1. Introduction

Flies are classified in the order of Diptera and sub-order of cyclorrhapha. cyclorrhapha. till now 15000 species of the flies in 158 families have been identified [1, 2]. The medically significant flies comprised in the Mucidae, Funidae, Callforadae and Sarcophagidae families [2, 3].

The flies due to their type of behavior, nutrition, capability to contaminate the food by sitting and transmitting the pathogenic organisms, like viruses, parasites and bacteria (shigella, salmonellae, streptococcus and staphylococcus), [6-8]. In addition, the larva of the flies' causelarva of the flies causes infection in man and animal [9]. A study in Tehran Township and suburb (2004) reported the presence of four medically significant flies of calliphora vomitoria, Lucilia richardsi, Sarcophaga fertoni, and Sarcophaga peregrina for the first time [10]. Mohsen masodi studied the clinical manifestation of ophthalmic myiasis caused by Oestrus ovis larva in 8 persons in Fars province (northern Iran), [11]. There was report on finding of chrysomya bezziana from the middle ear in Kashan (Iran). Also, a myiasis caused by lucilia sericata has been identified [12]. One of the disease control methods in the different regions is the fly control, because the studies at different developing countries have countries have shown that control of the flies has significant relationship with the decline of the diarrheal diseases and some ophthalmic infections, such as trachoma [13, 14].

Nowadays, in order to control the adult flies, various methods, such as hygienic burial of wastes, installing of net on the window and the door, using pesticide and adhesive trap are useful [8]. Till now, many studies on the prevalence of the flies from different regions of Iran have been conducted as follow: The forensic study on the Calliphoridae, Sarcophagidae, Mucidae and Fanniidae in Tehran city [15, 16].

The Calliphoridae in the Hormozgan province and in the triple-island [17,18] determining the species and the partial prevalence of the flies with medically significance in big tom and Small tomb and Abomosa islands [2] and determining the Mucidae flies in the Oromiyah Township (Iran), [19]. Considering the proper climatic condition of Mazandaran Province of Iran which provide suitable niche for the growth of various insects, particularly the flies and that identification and determining of the species level of vector insect is the first step in controlling the insect and the disease. Therefore, the present study was conducted to identify the flies of medically important in Sari Township.

2. Materials and Methods

This cross sectional descriptive study was done in 2014 on adult flies. The flies were hunted in different methods. 1- by hand and net, done generally at 10-11 AM. 2-by plastic bottle with cone opening to attract the flies, meat and food wastes put in the bottle, and the trap was put at three meters high, was set after the sun rise and removed after the sun set. The hunting places were the vegetable markets, the wastes deposit places, butchery stations, forest areas near the city, stall in the rural areas and the forest near the villages. The temperature and humidity of the day of collection were recorded. The flies were fixed with entomology needle, after killing the fly in glass container containing calcium cyanide. The data about the flies, such as place, time and the person collecting the fly attached and sent to laboratory of health College of Sari Township for identification. In the laboratory, using the Krzysztof szila (2013) identification table [20] and the other recommended identification table, the flies were identified. Gender identification of the Muscidae and Calliphoridae was determined from the distance of eyes but in the Sarcophagidae by observation of genital organ at the end of the abdomen. The obtained data was analyzed by descriptive statistics using spss software.

3. Results

In all, 3355 flies from Muscidae, Calliphoridae and Sarcophagidae families were hunted. Of them, 638 were collected by trap method, and 2717 using the net. In all, of the three families 7 species were medically significant; 2 species from Sarcophagidae, 3 species from Califoridae, and 2 from Mucidae family. From Sarcophagidae family, in all 46 flies were hunted; 12 (36.3%) sarcophagi Africa, 52(1.56%) sarcophagi argyrostoma. From Calliphoridae family, in all, 406 flies were hunted; 150 (4.47%) from lucilia sericata, 180(5.36%) chrsomyia albiceps, and 75(2.26%) from challiphora vicina.

From Muscidae family in all, 2885 flies were hunted; 2560 (76.30%) musca domestica and 325(9.69%) Muscina stabulance. In investigating the prevalence of the flies in different months of the year the highest rate of prevalence was noticed in the months of June 16.43% and July 17.58% and in the Januuary 1.05% and February 2.24%. In all, from 3355 hunted flies 1897 (56.54%) were female and 1458 (43.46%) were male.

Table 1: Number and prevalence rate of the hunted flies from different region of the Sari Township in different months of the year.

Number	Sampling month	Number of sample	%
1	March	190	5.67
2	April	237	7.06
3	May	551	16.43
4	June	590	17.58
5	July	486	14.48
6	August.	422	12.57
7	September	228	6.79
8	October	216	6.44
9	November	179	5.34
10	December	146	4.35
11	January	35	1.05
12	February	75	2.24
		3355	100

Table 2: The number and frequency of hunted flies from different regions of Sari Township.in 2015.

Family	Number (%)	Female (%)	Male (%)
Muscidae	2885 (%86)	1522 (%52.75)	1363 (%47.25)
Calliphoridae	406 (%12.10)	329 (%81.03)	77 (%18.97)
Sarcophagidae	64 (%1.90)	46 (%71.87)	18 (%28.13)
Total	3355 (%100)	1897 (%56.54)	1458 (%43.46)

Table 3: The number and prevalence rate of the hunted flies based on the gender from the different regions of Sari Township.

Fly species	Number (%)	Number (urban) (%)	Number (ruler) (%)
lucilia sericata	150 (4.47%)	65 (5.75%)	85 (3.83%)
chrsomyia albiceps	180 (5.36%)	32 (2.83%)	147 (6.65%)
challiphora vicina	76 (2.26%)	27 (2.39%)	49 (2.20%)
sarcophagi argyrostoma	52 (1.56%)	7 (0.62%)	45 (2.02%)
Muscina stabulance	325 (9.69%)	12 (1.06%)	313 (14.06%)
sarcophagi Africa	12 (0.36%)	0 (0%)	12 (0.55%)
musca domestica	2560 (76.3%)	987 (87.35%)	1573 (70.69%)
Total	3355 (100%)	1130 (100%)	2225 (100%)

4. Discussion

The flies due to the type of the behavior, nutrition and flying power and quick movement mechanically transfer the pathogenic organisms such, viruses, bacteria (salmonellae, shigella, staphylococcus, and streptococcus) through contact of their leg hair, oral content and fece to the food stuff [4-8]. In addition, the larva of the flies the man and animal [9]. Control of flies in different regions lead to the control of the diseases [13, 14]. The identification and determining of the insect's vector in each region is the first step in the management of the insect control and prevention of the disease. In this study,7 species in the families of calliphoridae, sarcophagidae, and Muscidae, like lucilia sericata, chrsomyia albiceps, challiphora vicina, sarcophagi argyrostoma, sarcophagi Africa, muscina stabulans and Musca domstica (house fly) that all are the medically significant flies [21] were hunted and studied. The obtained data of the present study correspond s with the results reported by Khobdel *et al*. (2002), Page T

(1996), Zargan *et al*. (202), [2-4]. Khobdel *et al*. (2001) hunted 10 medically important flies, lucilia sericata, chrsomyia megacephala, chrsomyia albiceps, challiphora vicina, sarcophagha aegyptica sarcophagha aegyptica, sarcophagi Africa, wohlfartia magnifica, muscina stabulans, Musca domstica and 1 species of the genus peregrina [10]. The highest frequency of prevalence belonged to Musca domstica 76.30% which corresponds with the data Khobdel *et al*. (2001). Presence of sarcophagi Africa was reported by Pape (1996) and Khobdel (2001) in Iran. Larva of this fly cause myiasis in man and animal. Therefore, it is medically and veterinary important [10, 23-25]. Investigation on the prevalence of the flies showed the highest rate in June and July months (16.43) and (17.58%), respectively. But the lowest rate in February and febrary months (Iranian calendar) 1.05% and 2.24% respectively.

The rate of prevalence in different regions is related to different reasons, such as food, humidity, optimum temperature, etc. On the other hand, cold and hot weather cause the flies to rest in the proper temperature places which is the reason of the rate of certain prevalence in different months of the year which agree with the data given by Khobdel *et al*. (2001), [2]. Of 3355 hunted files 1897 (56.54%) and 1458(43.46%) were female and male, respectively.

The rate of the female flies was higher than the male. It is because we used the meat waste food in the fly tap to hunt the flies, and we put the fly net in the waste discharge places and where the food was mixed with animal waste s and the female flies for the nutrition and laying egg and larva production prefer such places, which is the reason for the presence of the female flies, which correspond with the report given by Srinivasan (2006), Pape (1996) and Velásquez (2010), [23, 26, 27]. Since Mazandran province has good climatic condition provides a suitable niche for the growth and reproduction of the flies. Therefore, it is recommended that in addition to the management of the waste disposal and sanitation of the environment, the other method s of control, such as using pesticide, adhesive trap, and burning of the hospital waste, and installing of the net on the door and window.

5. Conclusion

In this study, in all 7 medically important species of the flies were hunted. Knowing that the high prevalence of flies is observed in the summer season at the Sari Township, the control of them should be done more attention. For the completion of the data on medically important flies at Sari Township, beside the morphologic methods the molecular methods are recommended.

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