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The Survey of Medically-Important Blowfly (Diptera: Calliphoridae) in Urmia County, Northwest of Iran

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Abstract: The blow fly (Calliphoridae) are flies of graet ecological, medical and sanitary importance because they are decomposers of organic matter, mechanical vectors of pathogenic agents and causer of myiasis. This study was conducted to ascertain the fauna of medicaly-important Calliphoridae in Urmia. The sampling process has been done during active seasons of of 2014 and 2015 (April, May, June, July, August and September) from 9 sampling sites have been selected. Two methods, bottle fly traps and net collecting have been used for sampling and The specimens identified by valid identification keys. In this study, a total of 1042 adult flies were collected include *Lucilia sericata* Meigen (43.8%), *Lucilia caesar* Linnaeus (1.8%) and *Lucilia* sp.* (0.3%), *Calliphora vicina* Robineau-Desvoidy (41.4%) and *Calliphora vomitoria* Linnaeus (0.9%), *Chrysomya albiceps* Wiedemann (7.5%), *Pollenia rudis* Fabricius (4.3%).

INTRODUCTION

Flies are members of order diptera and important as medically and veterinary pests due to their feeding behavior as decomposers of organic matters in most cases. In these cases they became as important mechanical vectors of viruses, bacteria, fungi, protozoa and other pathogenic agents to human and animal. They also can infest living tissues of vertebrates directly as agents of Myiasis diseases[1]. The Calliphoridae family, comprises about 1100 known species, named as blowflies and is among the most important fly families in both medical and veterinary point of view[2]. Members of this family are cosmopolitan and synanthropic flies and closely related to anthropogenic ecosystems[3]. They also can be used inforensic entomology for estimation of Post-Mortem Interval (PMI). Adults of blowflies are interested to nectar, corpse, scum and other garbage, filthy or bloody hair, wool or fur blowfly larvae feed in corpse or other decomposing organic matters[4].

Many studies about fauna of Calliphoridae flies have been done in East and South Asia Australasia, Europe and North and South America and published in various[5-8].

In the Middle East, identification of blowfly species is very difficult because this region is included three zoogeographical zones, palaearctic, oriental and Afrotropical. Moreover, the blowfly fauna of some countries have been studied defectively or not at all such as Bahrain, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Qatar, Syria and Yemen[3]. Except of non-medical species of family Calliphoridae, genus Polleniaspp, nine species of this family have been reported from some parts of Iran[9]. Diversity of Calliphoridae family in West Azerbayjan province has no more background. This study has been conducted with the aim of finding species diversity of Calliphoridae family in West Azerbayjan province in Northwest of Iran.

MATERIALS AND METHODS

West Azerbaijan Province is one of the 31 provinces of Iran placed in 45°2 47.57" longitude and 37°31 46.58" latitude.

The province is placed in the Northwest corner of the country bordering Turkey, Iraq and Nakhchivan Autonomous Republic and the provinces of East Azerbaijan, Zanjan and Kurdistan. Urmiacounty 74is biggest and paramount county of West Azerbaijan Province.

Urmia county is divided into five districts, central: with Urmia as the administrative seat, Anzal: with Qushchi as the administrative seat, Nazlu: with Nushin as the administrative seat, Silvaneh: with Silvane as the administrative seat, Sumay-ye Beradust: with Serow as the administrative seat.

In this study, 9 sampling sites have been selected from 5 districts of the county included: one site from Anzal district (Gharabagh), two sites from Sumay-ye Beradust district (Sufian, Sero), one site from Nazlu district (Nazlu), three sites from Central district (Urmia, Ghasemlou, band), two site from Silvana district (Silvana, Ziveh) (Fig. 1).

The sampling process has been done during active seasons of 2014 and 2015 (April, May, June, July, August and September). Two methods, bottle fly traps and net collecting have been used for sampling. Bottle traps were equipped with about 25 g of cow meat inside as bait and hanged up to 1.5-2 m above the ground level around farms, gardens and stock breeding. Adult flies collected and transferred to laboratory were killed by Chloroform and pinned, then was tagged with information as site, habitate and date of capture. The specimens identified by valid identification keys[9] (Fig. 2 and Table 1).

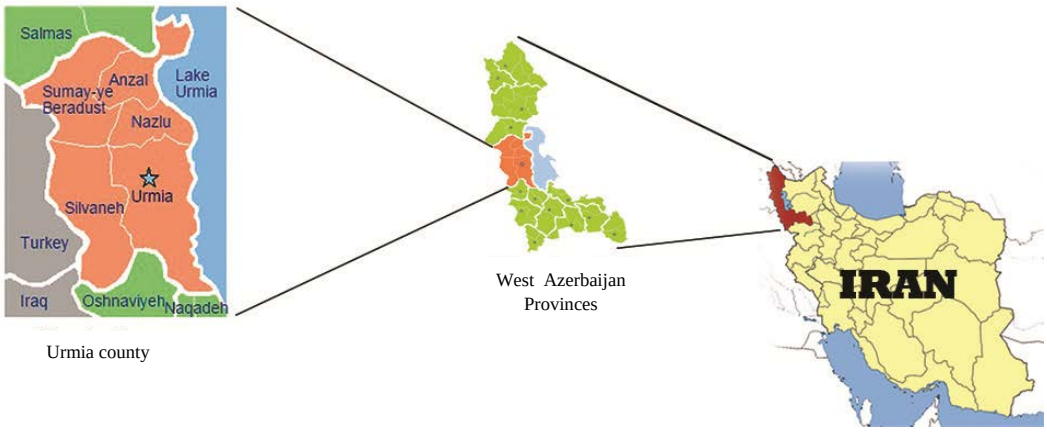

Fig. 1: Geographical situation of Urmiacounty, West Azerbaijan, Iran

Table 1: Systematic categorization, number and percentage of the captured spesies from Calliphoridae family

Subfamily	Genus	Species	Number of specimen	Percentage
Calliphorinae	*Lucilia*	*Lucilia sericata*	456	43.8
		Lucilia caesar	19	1.8
		Lucilia sp.*	3	0.3
	Calliophora	*Calliphora vicina*	432	41.4
		Calliphora vomitoria	9	0.9
Chrysominae	*Chrysomya*	*Chrysomya albiceps*	78	7.5
Polleniinae	*Pollenia*	*Pollenia rudis*	45	4.3
Total			1042	100

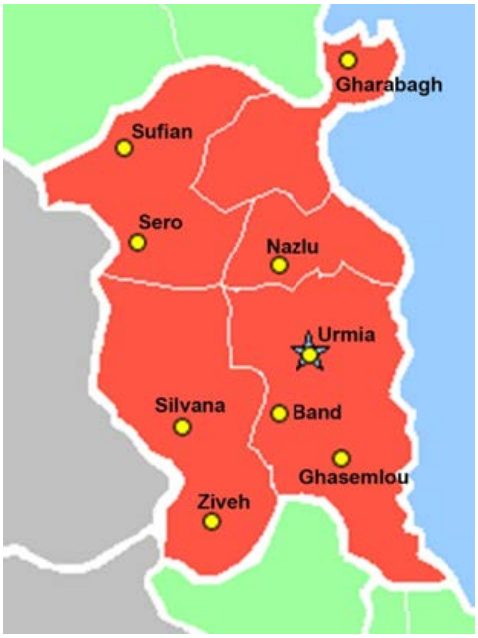

Fig. 2: Sampling localities indicated by point in Urmia county

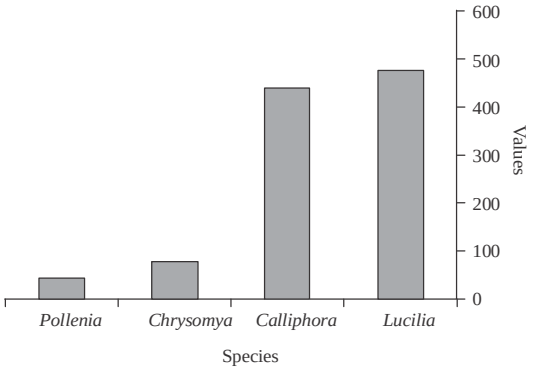

Fig. 3: The number of captured species from each genus

RESULTS

In this study, a total of 1042 adult flies were collected, 478 belonged to the genus *Lucilia*, 441 belonged to the genus *Calliphora*, 78 belonged to the genus *Chrysomya* and 45 were from genus *Pollenia*.

The 3 species from the genus *Lucilia* include *Lucilia sericata* meigen (43.8 %), *Lucilia caesar* Linnaeus (1.8%) and *Lucilia* sp.* (0.3%), 2 species from the genus *Calliphora* include *Calliphora vicina* robineau-desvoidy (41.4%) and *Calliphora vomitoria* Linnaeus (0.9%), 1 species from the *genus Chrysomya* include *Chrysomya albiceps* Wiedemann (7.5%) and finally, 1 species from the genus *Pollenia* include *Pollenia rudis* Fabricius (4.3%) (Fig. 3 and Table 1).

DISCUSSION

About 6 species identified in this study including: *Lucilia sericata*, *Lucilia caesar*, *Lucilia sp.** *Calliphora vicina*, *Calliphora vomitoria*, *Chrysomya albiceps* were medically important deu to their ability to mechanically transmit virus, bacterial and parasitic diseases such as diarrheic diseases and myiasis[10, 11]. Also, *Pollenia* species are known to cluster flies for their habit of clustering on walls and entering the walls and attics of homes to overwinter. When they become active in early spring or on warm winter days they can become annoying flies in houses, although, they neither bite nor contaminate food. The appearance of large numbers of these flies inside houses is often a worrying factor for homeowners and home builders, and the subsequent accumulation of dead adult flies around windows can lead to allergy problems or later issues with dermestid beetles that breed on the dead flies[12].

In other studies done in the Urmia, only 4 species (*Lucilia sericata*, *Calliphora vicina*, *Calliphora vomitoria*, *Chrysomya albiceps*) were reported[13]. *L. sericata* and *C. vicina* are cosmopolitan species and they have been reported from most parts of Iran[3, 13-15].

Morphological characters of *Lucilia* sp.* was very similar to *Lucilia ampulacae* Villeneuve but because the small sampling size of this species and some unknown characters, Molecular studies are needed for accurate identification. L. *ampulacae* hasn't been reported from Iran to date but there is a report on the presence of this species in Azerbaijan[16]. Moreover, According to studies done by Akbarzadeh *et al.*[9]. There is a probability of occurrence of L. *ampulacae* in North-West Iran[3].

CONCLUSION

According to the results, *Lucilia sericata* Meigen and *Calliphora vicina* robineau-desvoidy species accounted largest number and almost all areas have been captured. Also, Morphological characters of *Lucilia* sp.* was very similar to *Lucilia ampulacae* villeneuve but because the small sampling size of this species and some unknown characters, Molecular studies are needed for accurate identification.

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