

# Prevalence of medical and veterinary important Dipterans flies in Diyala province-Iraq

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(Received 5 June 2016, Accepted 19 January 2017)

## Abstract

Fauna of Iraq-Diyala's Calliphoridae and other Diptera flies of medically and veterinary importance was assessed by collection with hanging up modified baited flytrap. In this survey sex (6) genera and nine (9) species affiliated to Calliphoridae, Muscidae, Sarcophagidae and Fanniidae families. The species identified were *Calliphora vicina* (Robineau-Desvoidy 1830), *C. vomitoria* (Linnaeus 1758), *Pollenia spp.* (Robineau-Desvoidy 1830), *Lucilia cuprina* (Wiedemann 1830), *L. sericata* (Meigen 1826), *Musca domestica* (Linnaeus 1758), *M. sorbens* (Wiedemann 1830), *Muscina stabulans* (Fallen 1817), *Fannia canicularis* (Linnaeus) and *Sarcophaga africa* (Wiedemann 1824). The modified fish baited adult flytrap used in this study was serviceable and could be profitable for animals protection and field routine flies sampling to study Calliphoridae and other flies diversity and population dynamics.

**Key words:** Flies; Diptera; Calliphoridae; flytrap.

## انتشار ذبائبات رتبة ثنائية الاجنحة ذات الاهمية الطبية والبيطرية في محافظة ديالى

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### الخلاصة

تم تقييم مجموعة الذباب المعدني وغيره من ذباب رتبة ثنائية الاجنحة ذات الاهمية الطبية والبيطرية في محافظة ديالى-العراق ، بواسطة جمعها بمصائد ذباب محورة ذات طعم ; جمعت في الدراسة الحالية ستة اجناس وتسعة انواع تابعة لأربع عوائل هي الذباب المعدني وذباب اللحم والذباب المنزلي وذباب فانيا; كما وتم تشخيص انواع الذبائبات التالية: *Calliphora vicina* (Robineau-Desvoidy 1830), *C. vomitoria* (Linnaeus 1758), *Pollenia spp.* (Robineau-Desvoidy 1830), *Lucilia cuprina* (Wiedemann 1830), *L. sericata* (Meigen 1826), *Musca domestica* (Linnaeus 1758), *M. sorbens* (Wiedemann 1830), *Muscina stabulans* (Fallen 1817), *Fannia canicularis* (Linnaeus) and *Sarcophaga africa* (Wiedemann 1824). وجدت المصيدة المحورة ذات طعم السمك المستعملة في هذا البحث بانها قبلة للتطبيق وبكفاءة ويمكن التوصية باستخدامها لحماية الحيوانات الحقلية ولجمع العينات الحقلية الروتينية لدراسة التنوع الأحيائي للسكاني للذباب المعدني وغيره من ذباب ثنائية الاجنحة. الكلمات المفتاحية: الذباب المعدني ، ثنائية الاجنحة ، مصيدة ذباب.

## Introduction

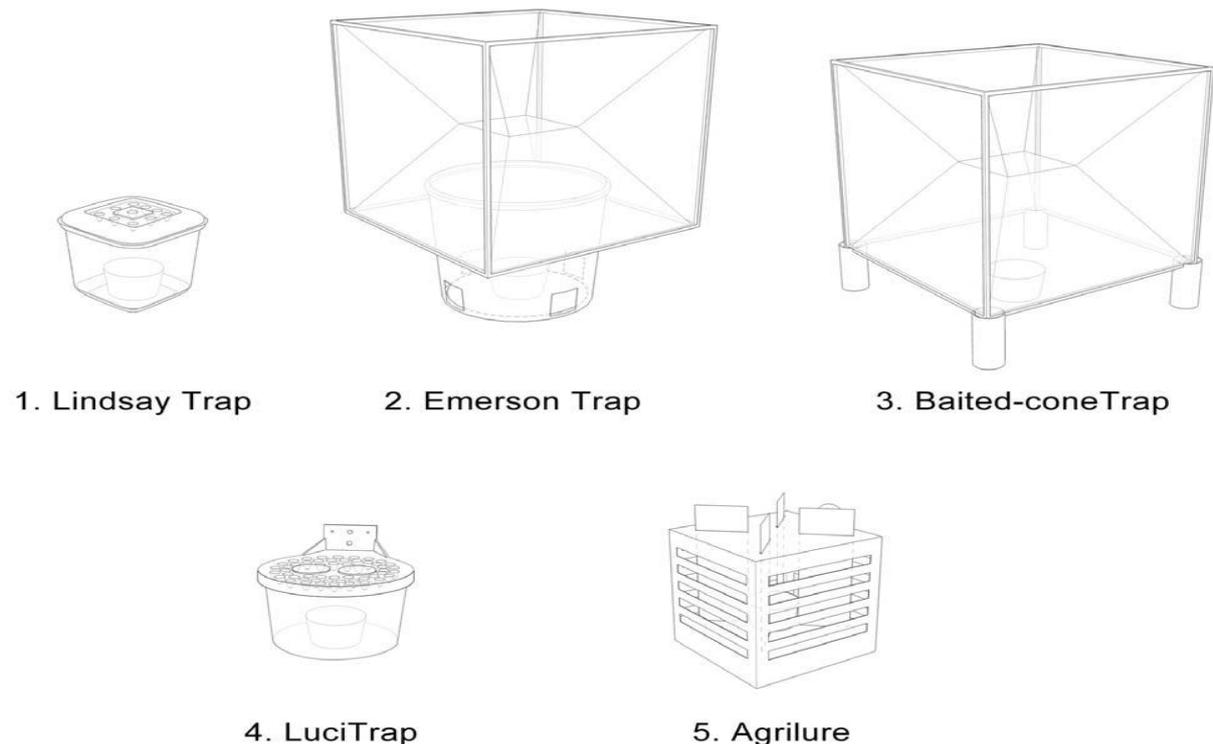
Calyptratae flies (Diptera, Scizophora, Brachycera) includes approximately 18000 species worldwide and contains Calliphoridae, Sarcophagidae and Muscidae which are majority among others; Members of those families have great value in forensic entomology due to their decomposer and synanthropic habits (1). Dipteran larvae flies

cause myiasis to hot blooded animals by tissue injury or mortality in animals in heavy infestation (2). Larvae flies implicated in obligatory myiasis needs living host tissue for feeding on; these obligate larvae parasites belong to few genera of Calliphoridae, Sarcophagidae, Oestridae; Oestrinae, Hypodermatinae, Gastrophillinae and

Cuterebrinae sub families; While larvae flies involved in facultative traumatic myiasis are generally carrion breeders and mostly of Calliphoridae more than Sarcophagidae and Muscidae; The adult flies are naturally attracted to smells of rotting flesh, carcass, and ignored wounds (3).

In Iraq *Chrysomya bezziana* fly is an obligatory parasite firstly recorded at 1996 in animals wounds (4). Calliphoridae family comprised 150 genera with more than 1,000 species were identified (5). Blow flies are fast fliers and can be very evasive if you attempt to catch them with a net; with exceptions if netting carried around carrion or near walls facing sunny rays on cool mornings where flies may converge in huge numbers; Malaise traps used to collect *Pollenia* and *Protocalliphora* which are rarely attracted to carrion (6). Over the years many

wool producers have been interested in trapping or baiting blowflies as a means of reducing fly strike; Various trap designs have been developed; e.g. Luci Trap (Manufacturers recommend the use of one trap per 100 sheep), Homemade blowfly trap, Large bait bin fly trap (7). Others fly trap raw fish baited for flies routine sampling used in Gambia (8), and India (9, 10), and in Iran (11). The fish bait used about 50gm fresh fish, the common and different flytraps utilized for catching blow flies are seen in the following illustrating diagram (12). This study had been determined to collect and identify Calliphoridae and other adult flies by a modified design of adult flytrap; the author is not aware of any other work on the collection of Diyala's flies fauna species of medically and veterinary important flies (Insecta: Diptera) by modified flytrap.



**Illustrating diagram explains the common and different flytraps utilizing for catching blow flies (Lindsay *et al.* 2012) (12).**

## Materials and methods

The modified fish baited flytraps were made from polyethylene covered lid container (dimensions 24×24×25cm), that had 4 conical openings constructed by wire seam (fig. 1, 2, 3, 4); The bait used for attract

flies about 50 gm. fresh fish changed continuously. Totally 5 adult modified flytraps were used; Survey was implemented in different areas of Diyala province (Baquba, Buhruz, Vet. Med., and Agriculture

College's stables) during October 2015 to March 2016. The collected samples transferred to the laboratory of parasitology, Diyala's Vet. Med. College. Larvae were washed out and preserved in 70% ethanol. Identification conducted by the author for the collected adult and larval specimens, and was

based on morphological identification keys and references (13, 14, 15, 16, and 17); The most important feature of the wings, for purpose of identification and classification, is the wing-venation; thoracic squamae and the hypopleuron bristles; abdomen and thorax shape and color.



Fig. (1, 2, 3, and 4): The modified baited fly trap during application in the stable.

## Results

Some meteorological information of 4 geographical parts of Diyala province displayed in fig. (5). Climate of Baquba classified as desert climate; with average annual temperature 22.8 °C. and average annual rainfall 186 mm; Coordinates: 33°45'N 44°38'E / 33.750°N 44.633°E (18). Different species of families flies Calliphoridae, Sarcophagidae, Muscidae, and Fanniidae were collected during the study period by the modified fish baited flytraps which were profitable to collect various groups of adult flies; In this survey, 6 genera and 9 species confined to 4 families Calliphoridae, Muscidae, Sarcophagidae and Fanniidae were identified. The species identified were *Calliphora vicina* (Robineau-Desvoidy 1830), *Calliphora vomitoria*

(Linnaeus 1758), *Pollenia* (Robineau-Desvoidy 1830), *Lucilia cuprina* (Wiedemann 1830), *L. sericata* (Meigen 1826), *Musca domestica* (Linnaeus 1758), *M. sorbens* (Wiedemann 1830), *Muscina stabulans* (Fallen 1817), *Fannia canicularis* (Linnaeus) and *Sarcophaga africa* (Wiedemann 1824). Photographs from dissecting microscope for the collected adult flies were shown in Fig. (6-15). The total number of adult flies trapped by the modified adult flytrap in Diyala province was 201 (Table 1). Generally flies population collected show high numbers in months of October (n =42) and March (n= 72) during the survey period; while the Calliphoridae flies species distributed highly in cold season months.

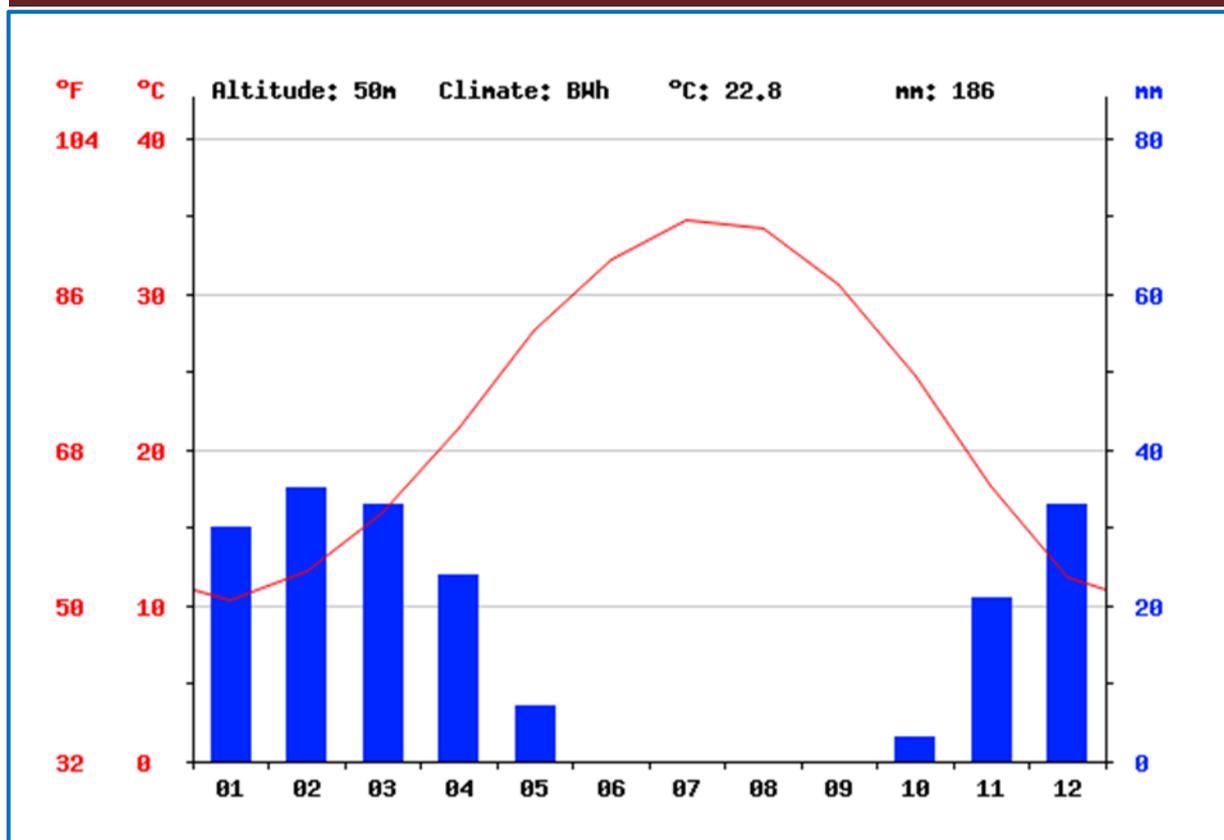


Fig. (5): Meteorological information of Diyala province.

Table (1): Total number of adult flies, collected by the modified fish baited flytrap in Dyiala province.

Species of fly	October	November	December	January	February	March	No.
<i>Calliphora vicina</i>	7	14	4	4	2	4	35
<i>Calliphora vomitoria</i>	4	17	26	4	-	4	55
<i>Pollenia species</i>	-	-	-	-	-	2	2
<i>Lucilia cuprina</i>	-	-	-	-	-	4	4
<i>L. serricata</i>	-	-	-	-	-	5	5
<i>Musca domestica</i>	10	5	8	-	-	14	37
<i>M. sorbens</i>	5	-	-	-	-	12	17
<i>Muscina stabulans</i>	1	-	-	-	-	6	7
<i>Fannia canicularis</i>	3	-	-	-	-	12	15
<i>S. haemorrhoidalis</i>	12	-	-	-	3	9	24
<b>Total</b>	<b>42</b>	<b>36</b>	<b>38</b>	<b>8</b>	<b>5</b>	<b>72</b>	<b>201</b>

## Discussion

Adult trapping process is the way to find medically important flies (19), and for routine field sampling and research surveillance and study of population dynamics as well as population control of flies (11). Flies fauna had been studied in different regions of Iraq profoundly but with lack of search in Diayala except of studies of (17) on Sarcophagidae and (20) for mentioning species of Muscid flies, *Musca domestica*, *Muscina stabulans* in Diyala through November 2010. Results showed

that four Families of flies (Calliphoridae; Sarcophagidae; Muscidae and Fannidae) were the most collected by fish baited flytrap in Diyala, this result is agreed with (21), and disagreed with (22) who mentioned that three families of flies were most dominated (Calliphoridae ; Sarcophagidae and Muscidae) in Babylon province when used attractive sticky trap and limited trap modified. Generally flies population collected in present study showed high numbers in months of October and March



**Fig.(6): *Calliphora vicina*, Fig.(7 a, b): *C. vomitora*, Fig.(8): *Pollenia spp.*, Fig.(9 a, b): *Lucilia cuprina*, Fig.(10 a, b): *L. serricata*, Fig.(11): *Musca domestica*, Fig.(12 a, b): *Musca sorbens*, Fig.(13 a, b): *Muscina stabulans*, Fig.(14): *Fania canicularis*, Fig.(15): *Sarcophaga haemorrhoidalis*.**

from the survey period, where it agreed with (21) who found the majority of the collected species were numerous through Spring and late Autumn (at lowest numbers); and for Calliphoridae flies species distributed highly in cold season months which were agreed with (21) particularly species of *Calliphora vicina*, but disagreed with (22) who stated that the population density of *Calliphora*

*vicina* and *Chrysomya albiceps* were appeared in highly level in spring only. Records in our study of species, *Calliphora vicina* (Robineau-Desvoidy), *Pollenia sp.* (Robineau-Desvoidy), *Lucilia cuprina* (Wiedemann), *L. sericata* (Meigen), *Musca domestica* (Linnaeus), *M. sorbens* (Wiedemann), *Muscina stabulans* (Fallen), *Fannia canicularis* (Linnaeus) and

*Sarcophaga africa* (Wiedemann); these results were agreed somewhat with (23, 21, 25, 24) successively; our study also disagreed with all previously references by its record of *Calliphora vomitoria* (Linnaeus) in Diyala. Results revealed one species of *Sarcophaga* genus, *Sarcophaga africa* (Wiedemann) which disagreed with (17) who recorded many species in Diyala. There was no capture record for *Chrysomya bezziana* in this study, where it was recorded in Baghdad by the same author in 1999 (26). The

modified flytraps constructed in present study were applicable to attract and collect various species of adult flies and could be used for scanning flies diversity and population dynamics. Variations in the results of other flies trapping studies with our research could be due to effect of changing the baits of traps, the place of traps (11) and the environmental temperature which is likely the most effective factor in the life history of short life cycle organisms like insects (27).

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