

# Diversity and Ecology of Butterflies and Moths in Wadi Gaza, Gaza strip, Palestine

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**Abstract-** Butterflies and moths were studied in regions of Wadi Gaza, extending from Salaha El-deen bridge west to Wadi Abo-Qatron near Wadi Gaza village to the east. The research is based on studying the diversity of butterflies and moths in terms of taxa diversity, Genera compositions, and family abundance.

In terms of family abundance, the survey showed that all recorded butterflies are belonging to five main families (Pieridae, Hesperidae, Lycaenidae, Nymphalidae, Papilionidae). The recorded moths are also belonging to five families (Arctiidae, Crambidae, Geometridae, Noctuidae, Sphingidae).

In terms of species and genera compositions and diversity, the survey revealed that butterflies are more abundant concerning diversity and richness than moths. The five families of butterflies are consisting of (19 genera) and (25 species) while the five families of moths are consisting of only (10 genera) and (11 species). The butterflies represented (69 %) of recorded species in the area of study while the moths were represented in (31 %) of the findings.

The most abundant family of butterflies is Pieridae with (36%) of all recorded butterflies, followed by Lycaenidae (32%). As for moths, the abundant families are Noctuidae, Geometridae, and Crambidae were each family was represented by (3 species), and they form (82%) of recorded moths. In this study all genera, in both moths and butterflies are represented only by one specie except six genera of butterflies and one genus of moths as each one is represented with two species, these six genera of butterflies are *Zizeeria*, *Vanessa*, *Colias*, *Pieris*, *Carcharodus*, and *Pointa* and that genus of moths is *Stemorrhages*.

**Index Terms-** Moths ,Butterflies ,Pieridae,abundant , Lepidoptera, Lycaenidae

## I. INTRODUCTION

Moths and butterflies have been divided more for convenience as the division is artificial, based on superficial differences. In the Lepidoptera group there are several smaller groups that differ from each other due to certain characteristics. Groups like skippers, swallowtails, whites, yellows, blues and Nymphalids have clubbed antennae and are called butterflies, while groups which do not have clubbed antennae are called moths. Though this division is not strictly scientific, it is not likely to be abandoned as it helps people to distinguish moths from butterflies (Kehimkar, 1997). Both butterflies and moths have many things in common, mainly scales that cover their bodies and wings. These scales are actually modified hairs. Butterflies and moths belong to the order Lepidoptera which means (Scaly wings). In spite of they belong to the same order with similar features, there are some different features between butterflies and moths as shown in table (1) (Carter, 1992). Of the 1.4 million species on the earth planet, over 53% are insects, while about 15,000-16,000 species of butterflies are known worldwide (Hassan, 1994).

**Table (1): Difference between butterflies and moths:**

Bio/ecological feature	Butterfly	Moth
Body	Thin and smooth	Thick and fuzzy
Antennae	Rounded clubs on the ends	Thin or often feathery
Wings	Held vertically when resting	Held flat against body when resting
Pupal Stage	Chrysalis	Cocoon
Color	Colorful	Dull
Active	During the day	During the night

Butterflies and moths live in a variety of land habitats on all continents except Antarctica. Their distribution is dependent on their food source. Habitat must provide the appropriate host plants for the caterpillars and good nectar sources for the adults. Major families of Lepidoptera order are Nymphalidae (brushfooted butterflies), Papilionidae (swallowtails), Hesperidae (skippers), Saturniidae (giant silk moths), Lymantriidae (tussock moths) and Noctuidae (loopers, owlet moths, and underwings) (Carter, 1992).

Lepidoptera originated when flowering plants were beginning to proliferate and have developed in close association with them. The earliest moth estimated to be between 100 to 140 Million years old, where butterflies have fossils back to 40 Million years old. This study is considered the first one in the Gaza strip, it is going to focus on the taxonomy and ecology of Lepidoptera, where they have great functions for the ecosystems.

In this article ecosystem and ecological prospective are considered, according to Wootton, (1993), the ecosystem value of butterflies and moths are:

- They are indicators of healthy functions of the ecosystem.
- They indicate a wide range of other invertebrates.
- They provide a wide range of environmental benefits, including pollination and natural pest control.
- They are important elements in the food chain (prey for birds, bats and other insectivorous animals).
- Butterflies have been widely used by ecologist as model organisms to study the impact of habitat loss and fragmentation, and climate change.

These values of Lepidoptera in terms of ecology is the primary goal of this article, but it has not gone in deepest because this study was the first and we made big effort to identify the butterflies and moths first, then introducing some comments about some of them .

The effect of Mediterranean, Irano-turanion and Sahro-Arabian can be observed in Wadi Gaza through the nature of flora and fauna observed there. Also the biodiversity richness contributes in the presence of insects in general and butterflies and moths in special. The previous factors are important for the insect diversity and can give an idea about their nature and their role in the health of the ecosystem.

## II. METHODOLOGY

### - Area of Survey:

This survey was done in the period from March, 2015 until the end of July 2015, this period is optimal to observe the butterflies and moths, these organisms are associated with flowering plants and high temperature and humidity.

The mentioned conditions typically exist in the study area at the study period. The survey has been taken in a part of Wadi Gaza located in the middle of Gaza strip, Palestine. This Wadi is dried and it extends from Hebron mountains in the east to the Mediterranean sea in the west, the length of the Part included in Gaza strip is 8 km. This part is rich in habitats, biodiversity and phytogeography. Figure (1) and Figure (2) shows the location of the Gaza strip in Palestine and the location of Wadi Gaza .Studies associated with this wadi showed the richness in ecosystem diversity, wetlands and swamps, terraces and slopes are exist, where the variety in biogeography are also exist (Madi, 2005).The survey included the part of Wadi Gaza starting from Salah el deen-bridge until Wadi Abo-Qatroun in the East.



**Figure(1) Location of the Gaza strip and Figure(2) shows the location of Wadi Gaza**

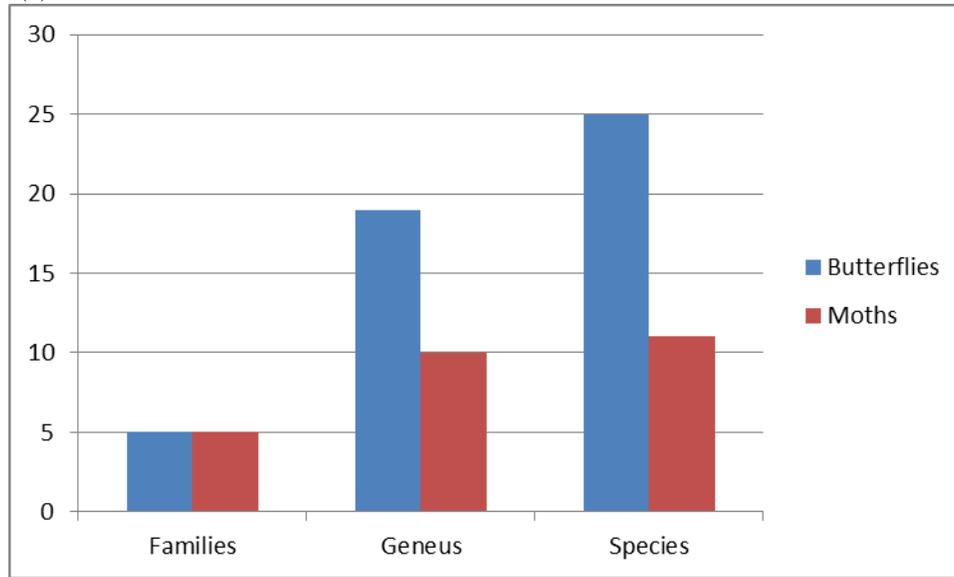
### - Methodology of this survey is based on three techniques:

- 1- Trapping of butterflies and moths.
- 2- Natural Photography and behavior field observations.
- 3- Data analysis using Ms Excel program.

## III. RESULTS

The study recorded 36 species of Lepidoptera order of insecta, 25of them are butterflies and 11 of them are moths. The results showed that the recorded butterflies belong to five families (Hesperiidae, Lycaenidae, Nymphalidae, Papilionidae and Pieridae). The eleven recorded species of moths also belong to five families (Arctiidae, Crambidae, Geometridae, Noctuidae and Sphingidae).

Butterflies are recorded with more diversity in terms of species richness and genus while they are the same in terms of families as demonstrated in figure (3).



The complete list of recorded butterflies and moths is demonstrated in table (2). The table shows the taxa whether it is butterfly or moth, the genus-species, family and the common name.

**Table (2): The recorded Moths and butterflies in the study area.**

Sp.NO	TAXA	FAMILY	SCIENTIFIC NAME	COMMON NAME
1	Butterfly	Hesperiidae	<i>Carcharodus alceae</i>	Mallow Skipper
2	Butterfly	Hesperiidae	<i>Carcharodus flocciferus</i>	Tufted Marbled Skipper
3	Butterfly	Hesperiidae	<i>Gegenes pumilio</i>	Dark Hottentot
4	Butterfly	Hesperiidae	<i>Pelopidas thrax</i>	White Branded Swift
5	Butterfly	Lycaenidae	<i>Deudorix livia</i>	Pomegranate butterfly
6	Butterfly	Lycaenidae	<i>Lampides boeticus</i>	long-tailed blue
7	Butterfly	Lycaenidae	<i>Leptotes pirithous</i>	Common Zebra Blue
8	Butterfly	Lycaenidae	<i>Lycaena thersamon</i>	The Lesser Fiery Copper
9	Butterfly	Lycaenidae	<i>Polyommatus icarus</i>	The common blue
10	Butterfly	Lycaenidae	<i>Pseudozizeeria maha</i>	The Pale Grass Blue
11	Butterfly	Lycaenidae	<i>Tarucus balkanicus</i>	Little Tiger Blue
12	Butterfly	Lycaenidae	<i>Zizeeria knysna</i>	Dark Grass Blue
13	Butterfly	Nymphalidae	<i>Melitaea ornata</i>	Jerusalem fritillary
14	Butterfly	Nymphalidae	<i>Vanessa atalanta</i>	The Red Admiral
15	Butterfly	Nymphalidae	<i>Vanessa cardui</i>	The painted lady
16	Butterfly	Papilionidae	<i>Papilio machaon</i>	The swallowtail
17	Butterfly	Pieridae	<i>Anaphaeis aurota</i>	African caper white
18	Butterfly	Pieridae	<i>Ascia monuste</i>	The Great Southern White
19	Butterfly	Pieridae	<i>Colias croceus</i>	Common Clouded Yellow
20	Butterfly	Pieridae	<i>Colias philodice</i>	Clouded Sulphur
21	Butterfly	Pieridae	<i>Euchloe belemia</i>	The Green-striped White
22	Butterfly	Pieridae	<i>Pieris braassicae</i>	The large white
23	Butterfly	Pieridae	<i>Pieris rapae</i>	The small white
24	Butterfly	Pieridae	<i>Pontia glauconome Klug</i>	Desert Bath White
25	Butterfly	Pieridae	<i>Pontia daplidice</i>	The Bath White
26	Moth	Arctiidae	<i>Utetheisa pulchella</i>	The Crimson-speckled Flunkey
27	Moth	Crambidae	<i>Stemorrhages costata</i>	The white palpita moth
28	Moth	Crambidae	<i>Stemorrhages sericea</i>	The large emerald pearl
29	Moth	Crambidae.	<i>Pleuroptya ruralis</i>	The Mother of Pearl moth
30	Moth	Geometridae	<i>Hypomecis punctinalis</i>	The Pale Oak Beauty

31	Moth	Geometridae	<i>Phaiogramma faustinata</i>	Green moth Millière
32	Moth	Geometridae	<i>Rhodometra sacraria</i>	The Vestal
33	Moth	Noctuidae	<i>Agrotis spinifera</i>	Gregson's Dart
34	Moth	Noctuidae	<i>Noctua pronuba</i>	The large yellow underwing
35	Moth	Noctuidae	<i>Spodoptera ciliium</i>	Dark mottled willow
36	Moth	Sphingidae	<i>Theretra alecto</i>	The Levant Hawk Moth



**Photo (1): *Carcharodus alceae* (Hesperiidae), Taken by Zuhair Dardona**

*Carcharodus alceae* is widespread in the Palaearctic region: it occurs from the Sahara to Northern Germany and from Portugal to the Altai, Turkestan and Kashmir, from where it penetrates the Oriental region along the Southside of the Himalayas to Mussoree; isolated from its main range where it occurs in Southwestern Arabia. Although it is a species of dry and warm localities, such as steppes, sunny slopes, dry meadows, etc., even flying in the semi-desert in Morocco, it ascends to 1600 m in the Alps (Kauffmann, 1951).



**Photo(2): *Gegeres pumilio* (Hesperiidae), Taken by Zuhair Dardona**

This butterfly is common and widespread on the coast from June onwards, with the autumn broods being by far the largest. It descends the Beqaa Valley from the Syrian desert, and in late autumn may be found to 1400 m NN in the mountains occasionally. It is probably permanently established in Lebanon, but is supplemented by migration from the south and attempts to colonies the mountains in autumn (LARSEN, 1974) .



**Photo(3): *Deudorix livia* (Lycaenidae), Taken by Zuhair dardona**

*Deudorix livia* is generally distributed in Saharan and Sub-Saharan Africa as far south as northern Kenya in the east. It is widespread in the Arabian Peninsula, reaching the Mediterranean Coast in Egypt, Palestine, Lebanon and Syria . It is an extremely polyphagous species with its larvae boring into the fruits of such diverse plants as *Acacia*, *Phoenix*, *Punica*, *Eriobotrya*, *Olea*, and even rice grains. Therefore, it is included in lists of potential or actual pests in some countries (MÜLLER et al., 2005)



**Photo (4): *Lampides boeticus*(Lycaenidae), Taken by Zuhair dardona**

The Long-tailed Blue is widely distributed in the Palearctic region from which it migrates into the Palearctic region. It is found virtually in all types of habitats. Collecting dates suggests that two broods emerge annually, one in May and June and another in September and October (Katbeh et al., 2003) .In the study area it was found feeding mostly on *Carduus argentatus* (Compositae) as seen in Photo(4)above.



**Photo (5): *Leptotes pirithous* (Lycaenidae), Taken by Zuhair dardona**

In Africa *Leptotes pirithous* is a very common and widely distributed species, and probably occurs in every country, although it has not yet been reported from Mali. It also occurs on Madagascar. *Leptotes pirithous* in Africa and Asia are popularly known as Zebra Blues. *Leptotes pirithous* was on a single occasion in 1938 captured in southern Britain, where it was given a different name - Lang's Short-tailed Blue. The latter name is misleading, as the butterfly is only distantly related to other "Short-tailed Blues", which are members of the genus *Cupido* (Everes). (<http://www.learnaboutbutterflies.com/Africa%20-%20Leptotes%20pirithous.htm>)



**Photo(6): *Lycaena thersamon* (Lycaenidae), Taken by Zuhair dardona**

The Lesser Copper occurs from Italy and Austria to the Balkans, the Middle East Afghanistan. Larsen & Nakamura (1983) discussed the sub specific forms of this species; *kurdistanica* and *omphale*, and concluded that the later is a valid subspecies for the Levant. Adults prefer the flowers of *Eryngium creticum*, while larvae feed on *Rumex*, *Sarothamunus* and *Polygonum* (Katbeh et al., 2003).



**Photo (7) *Polyommatus Icarus* (Lycaenidae), Taken by Zuhair dardona**

World range: Widespread (North Africa and Europe to Afghanistan)

Ecology: Meadows and open spaces up to 2000 m. Host-plants: Leguminous plants, probably *Medicago*. Two generations in most years, three in good years( Zalut, 2007) In the area of study it was found feeding on *Heliotropium* species (Boraginaceae) as seen in photo (7).



**Photo(8) *Pseudozizeeria maha* (Lycaenidae), Taken by Zuhair dardona**

The genus *Pseudozizeeria* comprises of a single species maha. It is widely distributed across much of Asia from Iran and Pakistan to China, Korea and Japan.

this species is found in open grassy habitats. It is most abundant on the plains, but also commonly occurs on savannah / woodland mosaics, *Acacia scrub*, and in forest glades and clearings. It can be found at elevations between sea level and about 800m.

<http://www.learnaboutbutterflies.com/India%20-%20Pseudozizeeria%20maha.htm>

In the study are it was found mostly feeding on *Polygonum equisetiforme*(Polygonaceae) and *Glinus lotoides* (Mullginaceae) as seen on photo (8) above.



**Photo (9): *Tarucus balkanicus*(Lycaenidae), Taken by Zuhair dardona**

World range: NW India and Afghanistan through the Middle East to the Balkans and Arabia, through the Sahel to Mauretania, Tunisia and Algeria. Ecology: Desert areas near host plant. Host-plant: *Zizyphus spina-christi* (Rhamnaceae). Three generations per year in Europe (Zalat, 2007)



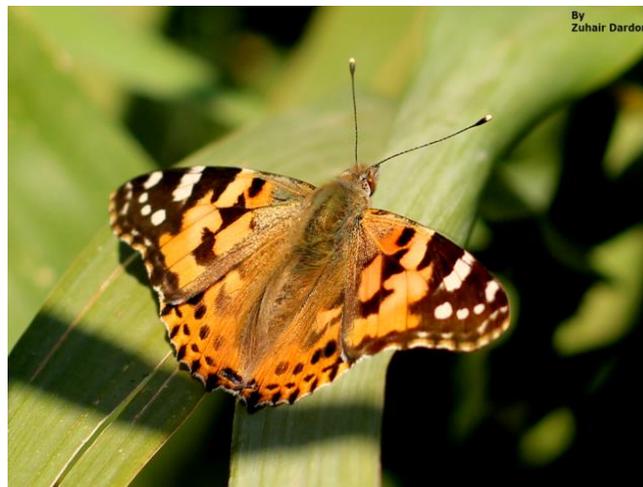
**Photo(10): *Melitaea ornata* (Nymphalidae), Taken by Ayman Dardona**

Although it has been demonstrated the *M. ornata* is rather a Ponto-Mediterranean Turkestanic species than a ponto-Mediterranean one, there are many unanswered questions about its distribution still remaining. *Melitaea ornata* is a mono- or oligophagous species feeding on different Asteraceae, mainly on regionally different, sometime endemic *Centaurea* species (Russell et al.2007) In the area of study it is rare observed and was found mostly feeding on *Capsella bursa-pastories* (Brassicaceae) as seen on photo (10)above .



**Photo(11): *Vanessa atalanta*(Nymphalidae), Taken by Zuhair Dardona**

The migrant *Vanessa atalanta* (*L.*) occurs throughout Europe and North Africa. In autumn, populations emigrate from northern and central Europe to the Mediterranean region to overwinter. In the spring, the northern range is recolonized by migrants from the south. The dynamics of the species in the winter range is poorly known. The complex phenology of *V. atalanta* in its southern range has evolved as a strategy to track larval resources through space and time. Autumn migration coincides with the greatest availability of the main food plant,. Late spring migration occurs by the time food quality is decreasing ( Stefanescu, 2001). It was found mostly feeding on *Verbesina encetioides* (Compositae) as seen in phtot (11) and on *Parietaria Judaica*.( Urticaceae).



**Photo(12): *Vanessa cardui* (Nymphalidae), Taken by Zuhair Dardona**

It is a marked opportunist, capable of rapid colonization of vast area in the temperate parts of the world each year, as these areas become favorable in spring. Many of its hosts, including Asteraceae and Malvaceae, are also good nectar sources, which makes it an interesting species with respect to the conflict between searching for adult and larval feeding resources (Bernays, 1998).



**Photo(13): *Papilio machaon* (Papilionidae), Taken by Ayman Dardona**

These are the largest and among the most brilliantly hued of all butterflies. The family is named for the long tails than several species at the lower end of the hindwings. There are around 700 known species of the swallowtails (Cassie, 2004). It was found in the Wadi Gaza feeding on *Foeniculum vulgare* (Apiaceae) where this plant is widely present near Wadi Abo-Qatroun in the East.



**Photo(14): *Anaphaeis aurota* (Pieridae), Taken by Zuhair Dardona**

The Caper white is a strong tropical migrant butterfly. (LARSEN & NAKAMURA (1983) referred to several occasions citing the migratory behaviour of this butterfly in Lebanon and Palestine. It feeds on *Capparis spinose* (Capparidaceae) and *Verbesina encetioides* (Compositae) as seen in photo (14).



**Photo(15): *Colias croceus* (Pieridae), Taken by Zuhair Dardona**

World range: Narrow (Mediterranean basin and Middle East, a migrant to most of Europe)

Ecology: Cultivated areas. Hostplants: Mainly (*Medicago* and *sativa*),. ( Several generations per year( Zalath, 2007)



**Photo(16): *Colias philodice* (Pieridae), Taken by Zuhair Dardona**

This butterfly is often seen swarming around mud puddles. The larvae feed on clover related plants ( Klass, 1956).



**Photo(17): *Euchloe belemia* (Pieridae), Taken by Zuhair Dardona**

World range: Narrow (Iberia to Iraq, with isolated populations in the Asir/Yemen mountains and in Ethiopia) Ecology: Rough places with flowers, in less arid places than *E.falloui*; with a pupal summer diapause. Host-plants: desert Cruciferae, although locally one species is usually preferred. Two or three generations per year ( Zalath, 2007) .



**Photo(18): *Pieris brassicae* (Pieridae), Taken by Zuhair Dardona**

The Large White is found from North Africa via most of Europe and the Middle East to the Himalayas. It occurs in Chile and South Africa. It is a migrant species.

It feeds on several species of family Brassicaceae and *Capparis spinosa* (Capparidaceae) (Katbeh et al., 2003).



**Photo(19): *Pieris rapae* (Pieridae), Taken by Zuhair Dardona**

The small white is one of the best known and commonly encountered temperate area butterflies. Although native to the Palaearctic, it is now nearly ubiquitous in suitable disturbed habitats in North America, New Zealand, and Australia. It has been extensively studied in the agricultural, ecological, and physiological literature (Robbins & Henson, 1986).



**Photo(20): *Pontia glauconome* (Pieridae), Taken by Zuhair Dardona**

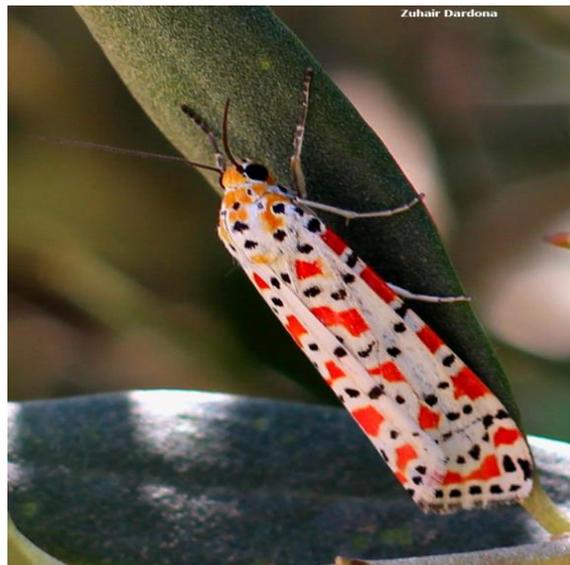
The Desert White is an eremic species found in North Africa, Arabian and Middle Eastern deserts. Larvae feed mostly on *Zilla spinosa* L. (Brassicaceae).

*baccatus* Del. (Resedaceae) (Katbeh et al., 2003)



**Photo(21): *Pontia daplidice* (Pieridae), Taken by Zuhair Dardona**

Until 30 years ago, *Pontia daplidice* was thought to represent a species with a vast distribution, from the Canary Islands in the west across most of the Palearctic region to Japan in the east (John et al., 2013).



**Photo(22): *Utetheisa pulchella* (Arctiidae), Taken by Zuhair Dardona**

The moth has yellowish white forewings patterned with black and red markings. The hind wings is white with irregular white lines. Distribute in Mediterranean Europe to Africa and Middle East (Carter, 1992)



**Photo(23): *Phaiogramma faustinata* (Geometridae), Taken by Ayman dardona**

*Phaiogramma faustinata* occurs mostly in dry and warm lowland habitats . The larva feeds polyphagous in the herb layer. It occurs in North Africa (south to Sudan), the Canaries, southernmost Europe (coastal areas of southern Portugal, Spain and rarely also Southern France, Balearic Islands, Sicily, Malta, Crete, Cyprus and from the Near East to the Arabian Peninsula.

([http://www.pyrgus.de/Phaiogramma\\_faustinata\\_en.html](http://www.pyrgus.de/Phaiogramma_faustinata_en.html))



**Photo(24): *Rhodometra sacraria* (Geometridae), Taken by Zuhair dardona**

The long thin caterpillar is pale brown or green. It feeds on Knotgrass, chamomile and other plants. A migrant species occurring throughout Europe, and ranging to North Africa and northern India ( Carter, 1992).



**Photo(25): *Pleuroptya ruralis* (Crambidae), Taken by Ayman dardona**

One of the largest of Britain's so-called 'micro-moths'; in fact it is larger than many of the 'macro-moths', though this division is largely artificial. The moth rests with all four wings on display, which show a colourful rainbow-like lustre in certain lighting conditions, as the English name suggests. Common throughout most of Britain, the adults fly from dusk onwards, and are often attracted to light. The larvae feed on nettle plants, in a rolled-up leaf.

(<http://ukmoths.org.uk/species/pleuroptya-ruralis/>)



**Photo(26): *Noctua pronuba* (Noctuidae), Taken by Zuhair dardona**

This distinctive moth is variable in both sexes, the forewings of the males range in color from mild- brown to brownish black, while those of females vary From reddish brown to yellowish or grayish brown. The hind wings of both sexes are deep yellow with a black border. The caterpillar feeds on dock and grasses, and a minor pest of garden flowers and vegetables. It distributes in Europe ranging to North Africa to western Asia( Carter, 1992)



**Photo(27): *Theretra alecto* (Sphingidae), Taken by Zuhair dardona**

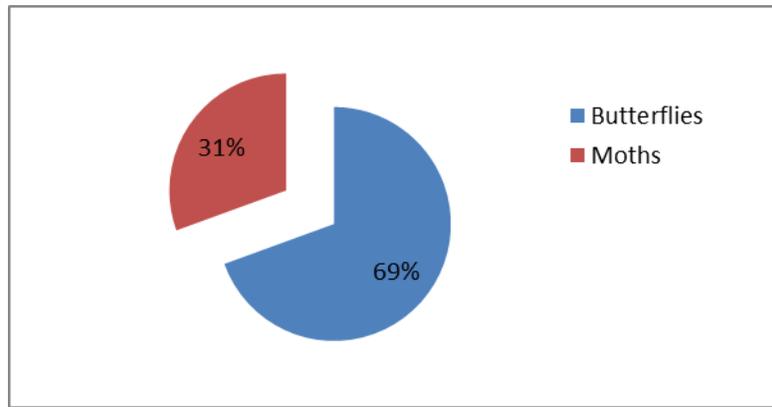
The hawk moths are medium to large-sized, heavy-bodied moths with characteristics of bulletshaped bodies and long, blade-like wings. Hawk moths are strong fliers, which can reach 40-50 km/hr. Hawk moths are represented by about 1000 species all over the world (Carter, 1992). Out of 1000, 63 species are distributed in western Palaearctic Region in which Turkey is located (Pittaway, 1993).

#### IV. DATA ANALYSIS

Data were analyzed by Excel sheets, as the research is a survey, the distributions and biodiversity richness were considered, the frequency tool used to check the taxa compositions , family compositions and genus varieties.

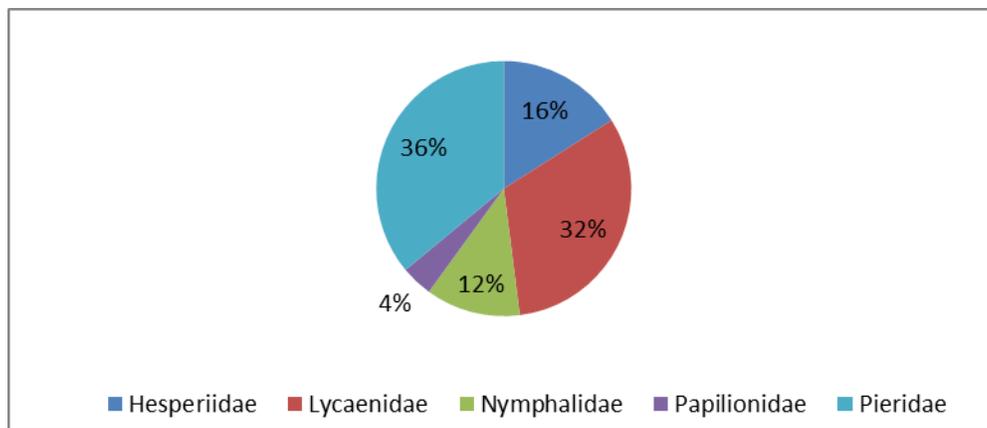
##### **2-1: Taxa compositions:**

This survey shows that the butterflies are abundant where they form (69%) of the recorded species while the moths are (31%) as shown in figure (4).

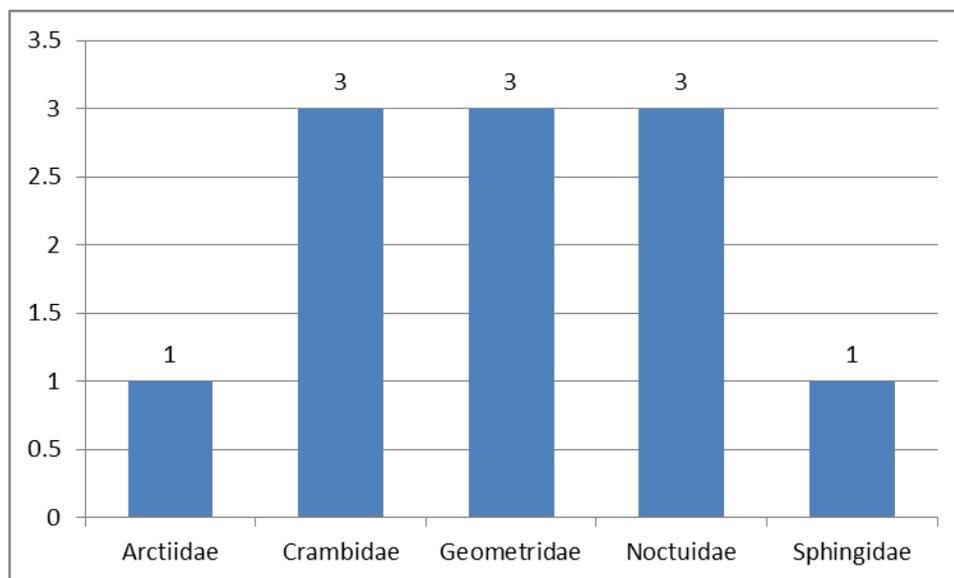


**2-2: Family compositions:**

Data revealed that the recorded butterflies are belonging to five main families, the most frequently recorded is Pieridae family (36%) followed by Lycaenidae (32%) and Nymphalidae(12%),figure (5)shows the family composition of butterflies .

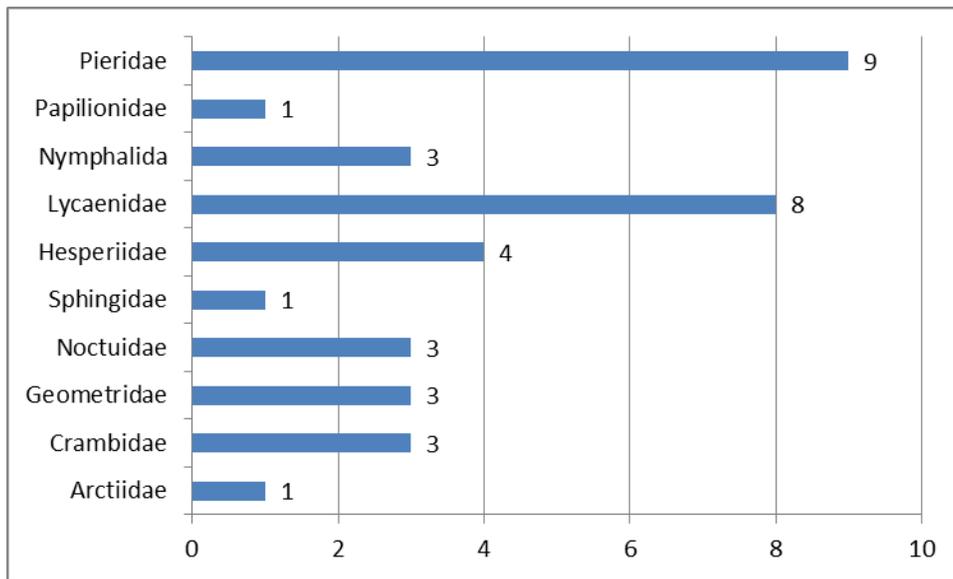


Regarding moths, data revealed that the recorded moths in the study area are belonging to five main families. Noctuidae, Geometridae and Crambidae are represented with three species for each family while the other two families have only one species for each, see figure (6)



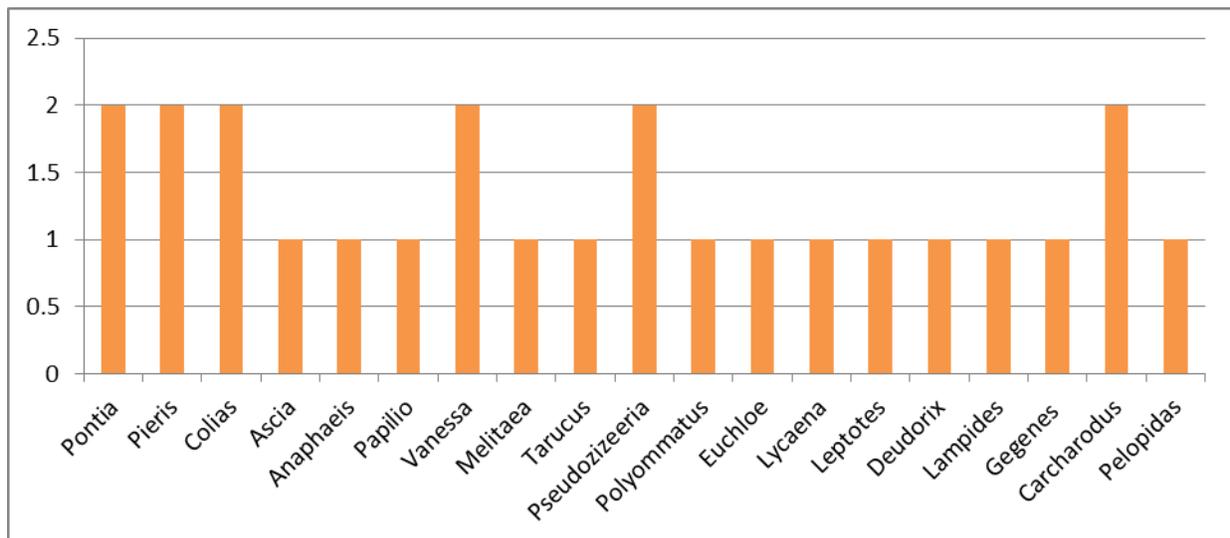
The previous analysis was done for each taxa separately, when the whole recorded (36 species) were analyzed data showed some significant figures indicating the abundance of butterflies with (25 species) and only (11 species) for moths. The most abundant family

for the recorded Lepidoptera in this study is Pieridae (9 species) followed by Lycaenidae (8 species), (4 species) for Hesperidae and (3 species) for Nymphalidae, Noctuidae, and Geometridae, as seen in graph (7).

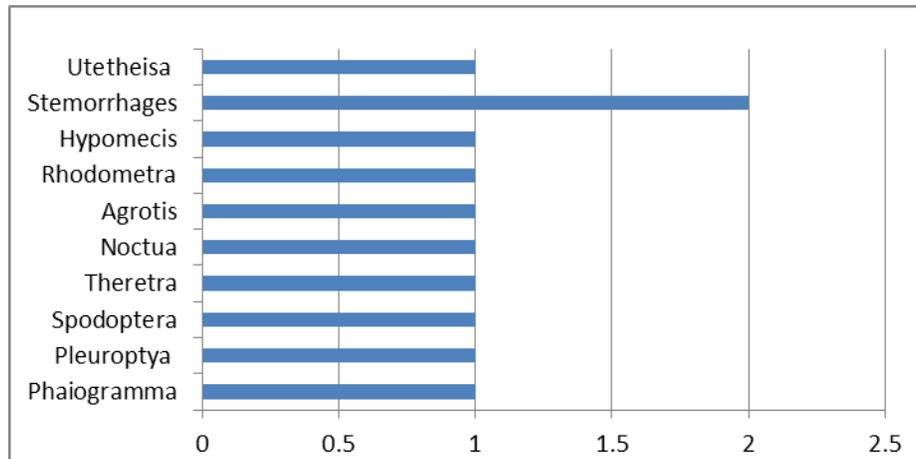


### 2-3: Genera compositions

The diversity in this spectrum indicates that there are (25 species) of butterflies belonging to (5 families) and (19 genera). Only six genera are represented with two species where each genus of them forms (8%) of the recorded butterfly genera while the others with one species, as seen in figure (8).



The genera composition in case of moths are more simple, that there are only (10 genera) belonging to (5 families) and (11 species), only one genera are represented with two species (*Stemorrhages*), the rest are represented only with one species for each as seen in figure (9).



## V. DISCUSSIONS

A total of 36 species of Moths and Butterflies were recorded from different ecological sites in Wadi Gaza, there is no published studies about butterflies and moths in Gaza so this study considered the first one. According to this study 69 % from the total recorded species are butterflies while the rest are moths, Though the number of butterflies is less than moths in nature, but during the time of this study in Gaza butterflies were abundant by (69 %) while moths are (31 %) only, this may because that ecological conditions were favorable for butterflies where the vegetation and flowering in spring attract these insects, also as the survey was done during daytime, where the activities of butterflies are more than the moths. Though some significant moths are recorded and documented in this time of survey.

Both taxa species (butterflies and moths) belong to five families for each, the richness in terms of family is the same in the two taxa, while there are significant diversity in terms of species and genera. The five families of butterflies are consisting of (25 species) and (19 genera) while the moths are only (11 species) and (10 genera). There are six genera in butterflies that have two species for each; these genera are (are zizeeria, Vanessa, Colias, Pieris, Carcharodus, and Pointa).

The most abundant family of butterflies was Pieridae with (36%) of all recorded butterflies, followed by Lycaenidae with (32%). As for moths, the abundant families are Noctuidae, Geometridae, and Crambidae were each family was represented by (3 species). Most recorded butterflies and moths are migrants from the Mediterranean region to the study area during the spring and summer as the study was carried out at this period.

Katbeh et al., (2003) studied the biodiversity of butterflies in Jordan, they recorded 91 species of butterflies, 19 of them were recorded in this study while 6 of the recorded butterflies in this study ( *Gegenes pumilio*, *Pelopidas thrax*, *Pseudozizeeria maha*, *Anaphaeis aurota*, *Ascia monuste* and *Colias philodice*) were not documented in Jordan. In another study carried out in Egypt by Zalut, (2007), 61 species of butterflies were recorded , 19 of them were recorded in this study while 9 were not documented in Egypt ( *Gegenes pumilio*, *Pseudozizeeria maha*, *Anaphaeis aurota*, *Colias philodice*, *Ascia monuste*, *Tarucus balkanicus*, *Carcharodus flocciferus*, *Melitaea ornata* and *Papilio machaon* )

According to the previous studies ( *Gegenes pumilio*, *Pseudozizeeria maha*, *Anaphaeis aurota*, *Ascia monuste* and *Colias philodice* ) were recorded only in Gaza, but *Pseudozizeeria maha* is the most dominant species and it was noticed that it is associate with specific type of vegetation, especially *Polygonum* genus ( *polygonaceae*) and *Glinus lotoids* ( *mullignaceae* ) these plants were very common in the area of study.

According to Zalut. (2007). *Papilio Saharae* and *Tarucus Rosaceus* were recorded in Egypt while *Papilio machaon* and *Tarucus balkanicus* were recorded in Gaza this can be explained by the deference's between Gaza and Egypt in both climate and vegetation. Finally it was noticed that butterflies are associated with several flora families, it is realized that the *compositaea* family was the most abundant in the study area, these plants usually dry in summer. The dried parts are good for moths.

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