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**A CONTRIBUTION TO THE KNOWLEDGE OF LEPIDOPTEROUS
 INSECT SPECIES IN EGYPT WITH EIGHT NEW-RECORDS**

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ABSTRACT

Three regions were chosen "Senoris, Fayoum Governorate; El-Baweti, Baharia Oasis, and Bolack, New Valley Governorate" for the enormous environmental differences between these regions such as, wild plants, agricultural plants, nearness or farness from Nile Valley, soil and geomorphology.

In this study, lepidopterous insects were focused for its economical effect on cultivated plants and wild plants.

In this study, 182 species belonging to 136 genera of 20 families were recorded. Similarity between the three areas was carried out using Sørensen equation. Regarding the similarity between families and species, the present data show that the highest similarity were between Senoris & Baweti, being in respective 91% and 72%, while, the least similarity were between Senoris & Bolack (88% and 64%, respectively). Bolack had the more specialized species with a total number of 43 species forming 59.72% of the total number of the specialized species. However, Senoris has 10 species comprising 13.89% and Baweti by 19 species representing 26.39%. Eight new-recorded species were collected during this study, four belonging to family Noctuidae "*Acontia hortensis* Smith; *Clytel syriaca* (Bugnion); *Agrotis sordzeana* Brondt; *Nola harouni* Wiltshire" and other four to family Pyralidae "*Staudnigeria yerburii* Bulter; *Hypotia colchicalis* H.-Sch.; *Parastenia daradis* (Chretien) and *Synaphe marbidalis* Guenée".

INTRODUCTION

A study of lepidopterous insects at three different areas during 2 years was carried out by different types of collection (light traps, hand sweeping net, ... etc.). Many authors used the light traps to investigate the population densities to compare between different areas in Egypt "Hosney, 1953; Hassanein, 1956; Hosney and Khattab, 1960, Nazmi, 1963; El-Sherif, 1965; Hanna and Atris, 1969; (a&b); Hanna and Atries, 1970; Hassanein *et al.*, 1971; El-Saadany and Rizk, 1973 (a&b); Hanna & Hamad, 1975; Hanna *et al.*, 1975; El-Kady *et al.*, 1980; Hamad *et al.*, 1983; Badr *et al.*, 1985 (a&b); El-Sayed, 1987; Salem *et al.*, 1989 and Marguerite & Abd El-fattah, 2001. Other authors studied the activity of the

insects collected by light traps (Forst, 1952; Graham, 1964; Glick & Graham, 1965 and Abdel-badi, 1977).

In this study, the new taxonomic taxa (Scoble, 1995; Adford, 1999 and Heppner, 2001), were used and the new species were identified.

The main objective of this work is to study the role of ecology and geomorphology on the distribution of lepidopterous insects and its existence, also the percentages were used to compare between these areas.

MATERIAL AND METHODS

Lepidoptera collection:

A variety of collecting techniques were necessary to obtain a good representation of lepidopterous adults. Light traps (Robinson light trap) and white pieces of cloth were used during the two successive years "January 2001 to December 2002" to collect the nocturnal lepidopterous moths from investigated regions. Hand net was used to collect the diurnal insects.

Collected lepidopterous insects were sorted to families, subfamilies, genera and finally to species in the Department of Entomology, Faculty of Science, Cairo University. Unidentified specimens were sent to the British Museum for identification.

Some adult specimens were preserved in alcohol and some others were pinned. For preparation of genitalia, the abdomen was separated and boiled in 10% caustic Soda solution for about 30 minutes, then washed in distilled water and dissected in 50% ethyl alcohol under a stereoscopic binocular microscope. Afterwards, the specimens were dehydrated in a series of alcohol, stained in Basic Fuchsin (dissolved in 70% alcohol) and dehydration continued gradually to 100% alcohol. The specimens were finally cleared in Xylol and mounted in Canada Balsam.

Description of the investigated areas:

a. Senoris "Fayoum":

Fayoum area occupies a circular deep depression at the northern part of the western desert between longitude 30° 23' and 30° 05' E and between latitude 29° 05' and 26° 35' N. It lies about 10-25 km to the west of the River Nile. The area consists of highly fertile cultivated land. It is usually covered with different seasonal plant species. Certain medicinal plants are planted in this area such as heban and hanzal. Some weeds, such as nigeel, halfa and hagana are common in the area. In cultivated places, winter crops such as wheat, barley, Egyptian clover, bean, onion, cabbage and tomatoes are grown. In summer, cucumber, maize and rice are the dominant cultivated crops. Meanwhile, alfalfa is cultivated all over the year. Fruit trees such as date palm, olive, citrus etc. are grown. The system of irrigation depends upon the fresh Nile water reaching via Bahr Yousef through Lahoun Barrage.

b. Bolack "New Valley":

The New Valley governorate is located in the western desert between longitude 31° and 30° east and between latitude 24° and 26° N.. The valley is a depression in the western desert located below the surrounding plateau, which ranges between 300-400m above sea level, while, the valley area is about 100m above sea level. The area is covered with different wild plant species; the most common are Nile acacia, athel and Dome palm and date palm exists in some places. Certain wild medicinal plants grow in the area such as datoura, oshar and hanzal. Some weeds, such as halfa and hagana are common in the area. In cultivated areas, winter crops such as wheat, barley, Egyptian clover, etc. are grown. In summer, cucumber, maize, peanut and rice are the dominant cultivated crops. Meanwhile, alfalfa is cultivated all over the year. Fruit trees such as date palm, olive, citrus, etc. are grown. The system of irrigation depends upon water supply pumped from wells at a depth of about 250-800m.

c) Baweti "Baharia Oasis":

Baharia Oasis is a depression lies between 27° 48' and 28° 30' of the Northern latitude and 29° 10' of the Eastern longitude. It is about 170 km west of the Nile valley. The area is covered with different wild plant species; the most common are Nile acacia, athel and date palm. Some weeds, such as halfa and hagana are common in the area. In cultivated areas, winter crops such as barley, Egyptian clover, etc. are grown. In summer, cucumber and maize are the dominant cultivated crops. Meanwhile, alfalfa is cultivated all over the year. The system of irrigation depends upon water supply pumped from wells at a depth of about 250-800m.

Statistical analysis:

It was performed by equations of Kontkanen (1957), Looman and Campbell (1960), Davis (1963) and Moritz (1963). The quotient of similarity (Sørensen) could be calculated according to the following formula:

$$QS = \frac{2j}{a+b}$$

where:

j, number of species found in both habitats,

a, number of species found in the 1st habitat,

b, number of species found in the 2nd habitat.

When $QS = 1$, the two habitats are considered similar, while

when $QS = 0$, the two habitats are considered completely different.

RESULTS AND DISCUSSION

Many differences existed between the three investigated areas due to many factors such as, the geographical location, meteorological conditions, cultivated plants, presence or absence of the wild plants, type of land. etc.

Table (1) shows that, 179 species were recorded belonging to 136 genera within 20 families from the different areas. Eight species, identified by Dr. K. Goodger and Dr. M. Shaffer from the British Museum, were recorded for the first

time from the Egyptian fauna. Four species belonging to family Noctuidae and four belonging to family Pyralidae. The four noctuid species collected from Bolack (New Valley) are *Acontia hortensis* Smith (Acontiinae); *Clytel syriaca* (Bugnion) (Catocalinae); *Agrotis sordzeana* Brondt (Noctuinae) and *Nola harouni* Wiltshire (Nolinae), while the four pyralid species collected from the different areas were, *Staudingeria yerburii* Butler (Phycitinae, Pyralidae) from Senoris and Bolack; *Hypotia colchicalls* H.-Sch from Bolack; *Parastenia daradis* (Chretien) and *Synaphe marbidalis* Guenee from Baweti.

Fourteen families were represented in all areas (forming 70% from all recorded families), while the other families (6 families) were recorded in 2 areas or at least one area (Coleophoridae from Senoris and Baweti and Pterophoridae from Bolack and Baweti, while Lymantriidae and Psychidae from Bolack only and Gracillariidae & Sesiidae from Baweti only).

Sixty seven species were recorded from all areas, 70 species recorded from one area only (10 from Senoris, 42 from Bolack and 18 species from Baweti) and 42 species from two areas (9 from Senoris and Bolack, 14 from Bolack and Baweti and 19 from Senoris and Baweti).

According to Scoble, 1995; Heppner, 2001 Marguerite & Abd El-Fattah; 2001, the two families Pyraustidae and Pyralidae are grouped under family "Pyralidae" which was divided into several subfamilies. Also the three families Danaidae, Nymphalidae and Satyridae grouped under family "Nymphalidae" while the two families Danaidae and Satyridae are categorized under the subfamilies "Danainae and Satyrinae".

Table (1): List of lepidopterous insect species collected from the three investigated areas during the two years 2001-2002

Taxa	Senoris	Bolack	Baweti
ARCTIIDAE			
Arctinae			
<i>Utetheisa pulchella</i> (Linnaeus)	*	*	*
COLEOPHORIDAE			
Coleophorinae			
<i>Coleophora euryaula</i> Meyrick			*
<i>Coleophora versurella</i> Zeller	*		*
COSMOPTERIGIDAE			
Cosmopteriginae			
<i>Cosmoptertx mimetes</i> Meyer		*	*
<i>Pyroderces simplex</i> (Wals.)	*		*
COSSIDAE			
Cossinae			
<i>Paropta paradoxa</i> Herris & Sch.		*	
Zeuzerinae			
<i>Phragmataecia castanea</i> Hübner		*	*
<i>Zeuzera pyrina</i> Linnaeus	*		

Table (1): Cont.

Taxa	Senoria	Bolack	Baweti
GELECHIDAE			
Anacampsinæ			
<i>Approerma anthyllidella</i> (Hübner)	*		*
Aristorelinæ			
<i>Sitotroga cerealella</i> (Oliver)	*	*	*
Chelariinæ			
<i>Anarsia acaciae</i> Walsingham	*	*	*
Gelechiinæ			
<i>Mirificarma fluvella</i> Duponchel			*
<i>Phthorimaea operculella</i> (Zeller)		*	*
<i>Scrobipalpa ocellatella</i> (Boyd)	*		
Pexicopiinæ			
<i>Pectinophora gossypiella</i> (Saun.)	*	*	*
GEOMETRIDAE			
Hemitheinae			
<i>Erionota thrax</i> Linnaeus		*	
<i>Hemidremadis affinis</i> Wiltshire	*		
Geometrinæ			
<i>Chlorissa faustinata</i> (Millière)	*	*	*
<i>Tephрина disputaria</i> Guenée		*	
Larentiinæ			
<i>Eupithecia ultimaria</i> Boisduval		*	
<i>Gymnoscelis pumilata</i> (Hübner)			*
<i>Gymnoscelis rufifaciata</i> (Haworth)	*		*
<i>Lithostega fissurata</i> Mabille		*	
Sterrhinæ			
<i>Idaea mareotica</i> Draudt		*	
<i>Idaea sordidior</i> Wiltshire			*
<i>Rhodometra sacraria</i> (Linnaeus)	*	*	*
<i>Scopula donovani</i> Distant	*	*	*
<i>Scopula luridata</i> Zeller		*	
<i>Scopula ochroleucaria</i> (H.-S.)			*
GRACILLARIIDAE			
Catoptiliinæ			
<i>Acrocercops conflua</i> Meyrick			*
HESPIRIDAE			
Hesperiinæ			
<i>Borbo barbonica</i> Lederer	*		*
<i>Gegones nostrodamus</i> Fabricius	*	*	*
LASIOCAMPIDAE			
<i>Anadissa undata</i> Klug		*	
<i>Anadissa obselata</i> Klug		*	
<i>Anadissa undata</i> Klug	*	*	
<i>Dendrolimus alferii</i> Anders-Seitz		*	*

Table (1): Cont.

Taxa	Senoris	Bolack	Baweti
LYCAENIDAE			
Lycaeninae			
<i>Lycaena phlaeas phlaeas</i> L.	*	*	
<i>Lycaena thersamon omphal</i> Klug	*	*	*
Polymmatinae			
<i>Agrodiaetus loewii uranicola</i> Walker		*	
<i>Freyeria trochylus trochylus</i> Freyer	*	*	
<i>Iolana alferii</i> Wiltshire		*	
<i>Lampides boeticus</i> L.	*	*	*
<i>Leptotes pirthous</i> L.			*
<i>Plebejus pylaon philbyi</i> Graves	*		*
<i>Tarucus balkanicus</i> Freyer	*	*	
<i>Tarucus mediterranea</i> B.-B.	*	*	*
<i>Tarucus rosaceus</i> Austaut		*	*
<i>Teracolus protomeidia</i> Klug	*		*
<i>Polyommatus icarus zelleri</i> Verity	*	*	*
<i>Zizeeria karsandra karsandra</i> Trim.	*	*	*
LYMANTRIIDAE			
<i>Cosama flavipalpata</i> Staudinger		*	
NOCTUIDAE			
Acontiinae			
# <i>Acontia hortensis</i> Smith		*	
<i>Acontia lucida</i> Hufnagel		*	*
<i>Euplemma cochylodes</i> Guenée		*	
<i>Euplemma ostrina</i> (Hübner)	*	*	*
<i>Euplemma gayneri</i> (Roth.)	*	*	
Amphipyriinae			
<i>Amphipira tetra</i> Fabricius		*	
<i>Athetis atriluna</i> Guenée	*	*	*
<i>Athetis clavipalpis</i>			*
<i>Autophila cerealis</i> Staudinger		*	
<i>Autophila pauli</i> Boursin	*	*	*
<i>Propsalta coptica</i> Wiltshire	*		*
<i>Sesamia cretica</i> Lederer	*	*	*
<i>Sesamia nonagrioides</i> Lefebuvre	*		*
<i>Sesamia waltishieri</i> Rungs	*		
<i>Spodoptera ciliatum</i> (Lederer)	*	*	*
<i>Spodoptera exigua</i> (Hübner)	*	*	*
<i>Spodoptera littoralis</i> (Boisduval)	*	*	*
Catocalinae			
<i>Acanthilipes circumdata</i> Walker		*	
<i>Chytel benenotata</i> (Warren)			*
<i>Chytel halfae</i> Habicht	*	*	*

Table (1): Cont.

Taxa	Senoris	Bolack	Baweti
<i>Clyteï sancta</i> Hübner	*	*	*
# <i>Clyteï syriaca</i> (Bagnion)		*	
<i>Grammodes geometrica</i> F.	*	*	*
<i>Mitoponris costiplaga</i> Warr.			*
<i>Ophiusa tirhaca</i> (Cramer)	*	*	*
<i>Percyma squalens</i> (Walker)	*		
Chloephorinae			
<i>Earias insulana</i> Boisduval	*	*	*
Hadeninae			
<i>Discestra trifolii</i> (Hufnagel)	*	*	*
<i>Hecatera spinaciae</i> Vieweg		*	
<i>Mythimna consanguis</i> (Guenée)	*	*	*
<i>Mythimna loreyi</i> (Duponchel)	*	*	*
<i>Mythimna unipuncta</i> Haw.	*	*	*
<i>Mythimna zaeae</i> (Duponchel)	*		*
Heliothinae			
<i>Helicoverpa armegira</i> Hübner	*	*	*
<i>Heliothis nubigera</i> (H.-Sch.)	*	*	*
<i>Heliothis peltigera</i> (D. & Sch.)	*	*	*
<i>Protoscania scutosa</i> Denis & Sch.		*	
Hypeninae			
<i>Rhynchina eremialis</i> Swinhoe	*		*
Noctuinae			
<i>Agrotis herzogi</i> Rebel	*		
<i>Agrotis ipsilon</i> (Hufnagel)	*		*
<i>Agrotis puta</i> Hübner		*	*
<i>Agrotis segetum</i> (Denis & Sch.)	*	*	*
<i>Agrotis spinefera</i> (Hübner)	*	*	*
# <i>Agrotis sordzeana</i> Brondt		*	
<i>Agrotis trux</i> (Hübner)			*
<i>Euxoa canariensis</i> (Boursin)	*	*	*
<i>Noctua pronuba</i> Linnaeus	*	*	*
<i>Ochropleura imperator</i> Bang-Haas		*	
<i>Ochropleura melanuroides leucomelas</i> Bour.		*	*
Nolinae			
# <i>Nola harouni</i> Wiltshire		*	
Plusiinae			
<i>Autographa gamma</i> (Linnaeus)	*	*	*
<i>Chrysodeixis chalcites</i> (Esper)	*	*	*
<i>Syngrapha circumflexa</i> (L.)	*	*	*
<i>Trichoptusia daubei</i> (Boisduval)	*		*
<i>Trichoptusia orichalcea</i> F.	*	*	*
<i>Trichoptusia circumscripta</i> (Fre.)	*	*	*
<i>Trichoptusia ni</i> (Hübner)	*	*	*

Table (1): Cont.

Taxa	Senoris	Bolack	Baweti
Sarothripinae			
<i>Charocoma nilotica</i> Rogenhofer		*	
NYMPHALIDAE			
Danainae			
<i>Danaus chrysippus</i> Linnaeus	*	*	*
Nymphalinae			
<i>Cynthia cardui</i> Linnaeus	*	*	*
<i>Junonia lintingensis cebrene</i> Tri.	*		*
<i>Vanessa atalanta</i> Linnaeus		*	
PIERIDAE			
Coliadinae			
<i>Colias croceus</i> Fourcroy	*	*	
<i>Colotis chrysonome</i> klug	*	*	*
<i>Colotis liagore</i> Klug	*		*
<i>Madias fausta</i> Oliver		*	
Pierinae			
<i>Pieris rapae</i> Linnaeus	*	*	*
<i>Pontia daplidice</i> Linnaeus	*		*
<i>Pontia glaucanome</i> Klug	*	*	
PLUTELLIDAE			
Plutellinae			
<i>Plutella xylostella</i> (Linnaeus)	*	*	*
PSYCHIDAE			
Oiketicinae			
<i>Amicta amictoides</i>		*	
PTEROPHORIDAE			
Pterophorinae			
<i>Emmelina momodactyla</i> L.		*	*
PYRALIDAE			
Crambininae			
<i>Bazaria fulvofasciata</i> Denis & Sch.			*
<i>Euchromius cambridgei</i> (Zeller)	*	*	
<i>Euchromius ocellus</i> (Haworth)	*	*	*
Evergestinae			
<i>Cornifrons ulceralis</i> Lederer	*		
Galleriinae			
<i>Arenipses nitidicostella</i> Hampson		*	
<i>Arenipses sabella</i> Hampson	*		*
<i>Lamoria anella</i> Denis & Sch.		*	
Glaphyriinae			
<i>Hellula undalis</i> Fabricius		*	*
Phycitinae			
<i>Ancylosis faustinella</i> Ragonot	*		
<i>Ancylosis hellentica</i> (Staudinger)	*	*	*

Table (1): Cont.

Taxa	Senoris	Bolack	Bawcti
<i>Anerastia nitidicostella</i> Ragonot		*	
<i>Cadra cautella</i> (Walker)	*	*	*
<i>Ephestia kuehniella</i> (Zeller)	*	*	*
<i>Etella zinckenella</i> Treitschke	*	*	*
<i>Raphimetophus oblutella</i> Zeller		*	
<i>Euzophora osseatella</i> Treitschke			*
<i>Hypogryphia uncinatella</i> Ragonot		*	
<i>Phycita potriella</i> (Zeller)		*	
<i>Staudingeria fratifasciella</i> Ragonot			*
# <i>Staudingeria yerburii</i> Butler	*	*	
Pyralinae			
<i>Antigastra catalaunalis</i> Dup.		*	
<i>Chilo agamemnon</i> Bleszynski	*		*
<i>Clorissa faustinata</i>		*	
<i>Dattia myalis</i> Rothschild		*	*
# <i>Hypotia colchicalis</i> H.-Sch.		*	
# <i>Parastenia daradis</i> (Chretien)			*
<i>Pyralis farinalis</i> (Linnaeus)	*	*	*
<i>Pyralis galactalis</i> Haworth		*	
<i>Schoenobin niloticus</i> Zeller	*		
# <i>Synaphe marbidalis</i> Guenée			*
<i>Uresiphita polygonalis</i>		*	
Pyraustinae			
<i>Achyra nudalis</i> (Hübner)			*
<i>Herpetogramma licarsialis</i> W.	*	*	*
<i>Noctuella storalis</i> Hübner	*	*	*
<i>Nomophila noctuella</i> (D. & Sch.)	*	*	*
<i>Palpita unionalis</i> Hübner	*	*	*
<i>Plodia interpunctella</i> Hübner	*	*	*
<i>Pseudoschima ulceratalis</i> Lederer		*	
<i>Pyrausta aurata</i> Scopoli		*	*
<i>Pyrausta incoloralis</i> Duponchel	*	*	*
<i>Oeobia ferrugalis</i> Hübner		*	
<i>Ostrina nubilalis</i> Hübner	*	*	*
<i>Spolodea recurvalis</i> (Fabricius)	*	*	*
<i>Tegostoma baphialis</i> Staudinger	*	*	*
SESIDAE			
Aegeriinae			
<i>Synanthedon myopaeformis</i> (Bork.)			*
SPHINGIDAE			
Macroglossinae			
<i>Daphnis nerii</i> (Linnaeus)	*	*	*
<i>Hippotion celerio</i> (Linnaeus)	*	*	*
<i>Hyles lineata</i> Fabricius		*	

Table (1): Cont.

Taxa	Senoris	Bolack	Baweti
<i>Hyles livornica</i> (Esper)		*	*
<i>Macroglossum stellatarum</i> (L.)		*	
<i>Theretra alecto</i> (Linnaeus)	*		*
Sphinginae			
<i>Acherontia atropos</i> (Linnaeus)	*		*
<i>Agrius convolvuli</i> (Linnaeus)	*	*	*
TINEIDAE			
Scardinae			
<i>Episcaridia lardatella</i> Lederer		*	
Tineinae			
<i>Niditinea fuscella</i> (Linnaeus)	*	*	*
<i>Trichophaga abruptella</i> Wollaston	*		*
TORTRICIDAE			
Olethrutinae			
<i>Bactra lancea</i> Hubner		*	*
<i>Cirriphora pharaonana</i> (Koller)	*		
<i>Cydia phaulomorpha</i> Merrik			*

* new recorded species

Similarity of families:

a. Senoris X Bolack

The total number of families recorded in Senoris were 15 families, while those in Bolack were 17 families.

$$QS = 0.88$$

This means that the similarity between the two areas was 88%.

b. Senoris X Baweti

The total number of families recorded in Baweti were 18 families. Fifteen families were recorded in both areas, while three families were recorded in Baweti only.

$$QS = 0.91$$

Similarity between the two areas was 91%.

c. Bolack X Baweti

Fifteen families were recorded in both areas, while three families were recorded in Baweti only, but two families were recorded in Bolack..

$$QS = 0.86$$

Similarity between the two areas was 86%.

As a conclusion, the highest percentage of shared families was 91% (by sites Senoris and Baweti). Meanwhile, the lowest one was 86% (by sites Bolack & Baweti).

Similarity of species:

a. Senoris X Bolack

The total number of species recorded in Senoris were 106 species, opposed to 132 species in Bolack. Seventy six species were recorded in both areas.

QS = 0.64

This means that the similarity between the two areas was 64%.

b. Senoris X Baweti

The total number of species recorded in Baweti were 120 species, eighty one species were recorded in both areas.

QS = 0.72

Similarity between the two areas was 72%.

c. Bolack X Baweti

Eighty seven species were recorded in both areas.

QS = 0.69

Similarity between the two areas was 69%.

Accordingly, the highest percentage of shared species was 72% (by sites Senoris and Baweti), while the lowest one was 64% (by sites Senoris & Bolack).

Concluding all the previous data, the quotient of similarity between families and species in the three investigated areas could be traced in Fig. (1).

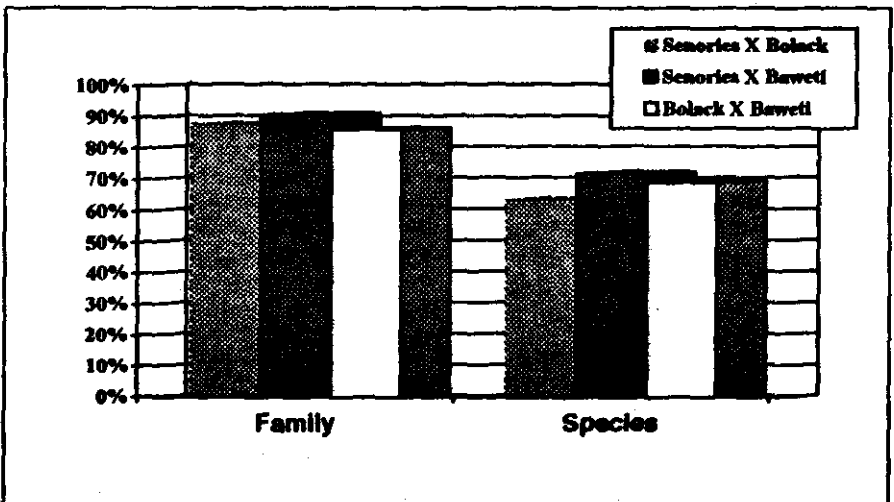


Fig. (1): Shared families and species among the three studied areas.

Fig. (1) indicated that the highest shared areas were Senoris & Baweti (91% families & 72% species). The type of land (clay), habitat of agriculture and crops are similar, although they differ in wild plants and the height of land above the sea. However, the lowest shared areas were Senoris & Bolack, as each area has its own characteristic habitat, land climate, agricultural ways and plant crops.

Endemic species:

Fig. (2) showed the specialized species for each. Bolack had the highest number of specialized species with a total number of 43 species forming 59.72% of the total number of specialized species, followed by Baweti that was represented by (19 species representing 26.39%). And finally Senoris that was represented by 10 species forming 13.89%.

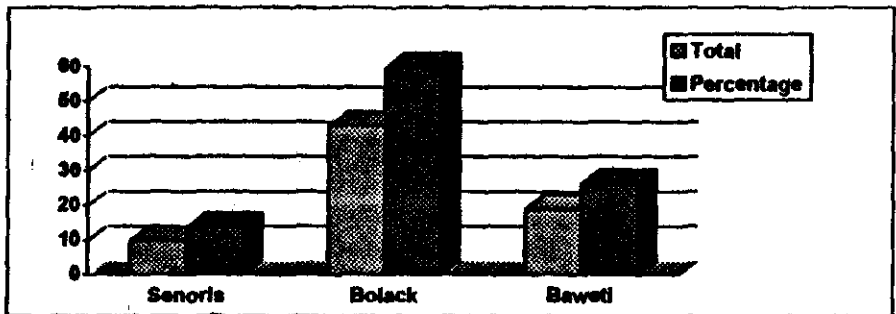


Fig. (2): Total numbers of endemic species recorded from the three studied areas

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معلومات إضافية على رتبة حرشفيات الأجنحة في مصر مع تسجيل ثمالي أنواع لأول مرة في مصر

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تم اختيار ثلاثة مناطق هي سنورس (محافظة الفيوم)، البايوطي (الواحات البحرية) وبولاق (محافظة الوادي الجديد) لهذه الدراسة، نظراً للاختلافات الكبيرة في المناخ، النباتات الطبيعية، المحاصيل الزراعية، و قربها أو بعدها من وادي النيل بالإضافة إلى الاختلاف في طبيعة التربة.

في هذه الدراسة تم الاهتمام بحصر أنواع الحشرات التابعة لرتبة حرشفيات الأجنحة نظراً لأهميتها الاقتصادية وتأثيرها على النباتات الطبيعية و الزراعية. تم جمع ١٨٢ نوعاً تتبع ١٣٦ جنساً ينتمون إلى ٢٠ فصيلة. تم مقارنة الأنواع بين المناطق الثلاثة إحصائياً باستخدام معادلة سنوريس "Senoris". أوضحت النتائج أن أقرب المناطق تشابهاً هما منطقتي سنورس و البايوطي حيث كانت النسبة المئوية لتشابه الأنواع و الفصائل هي ٧٢% و ٩١%، على الترتيب، بينما كانت أقل المناطق تشابهاً هما منطقتي سنورس و بولاق حيث كانت النسبة المئوية للفصائل و الأنواع هي ٨٨% ، ٦٤%، على الترتيب. و تميزت منطقة بولاق بوجود أكبر عدد من الأنواع المميزة للمنطقة حيث تم تسجيل ٤٣ نوعاً تمثل ٥٩,٧٢% من مجموع الأنواع بينما كانت سنورس هي أقل المناطق تسجيلاً للأنواع المميزة ١٠ أنواع، (١٣,٨٩%)، و كان عدد الأنواع المسجلة في البايوطي هي ١٩ نوعاً (٢٦,٣٩%). كما أنه تم تسجيل ثمانية أنواع جديدة على البيئة المصرية خلال هذه الدراسة، أربعة منها تتبع فصيلة نوكتونيدي *Acontia horentsis* Smith, *Clytel sylvata* (Bugnior), *Agrotis* (Sordzeann Brondt and Nola harouni Wilt.) و أربعة أنواع تتبع فصيلة بيرليدي *Staudnigeria yerburli* Butler, *Hypotia colchicalis* H.-Sch., *Parastenia daradis* : (Chretien) and *Synaphe marbidalis* G. "