

Studies catches of certain species of nocturnal coleoptera as indicated by two different light traps at two different levels in Qena Governorate

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ABSTRACT

Forty eight species belonging to forty three genera were identified. These genera were arranged into eighteen families. Scarabaeidae includes 9 species. Tenebrionidae includes 7 species, whereas Staphylinidae, Elateridae and Carabidae include 4 species. On other hand, the remaining thirteen families includes between 1-3 species. The total catches were over (40,000 individuals), which captured by one trap in the first year (2007-2008), and four traps in the second year (2008-2009) at two different levels.

INTRODUCTION

The seasonal fluctuation of nocturnal Coleoptera has received much attention, after Rothamsted in England, like nocturnal Lepidoptera. TÓTH (1972, 1973) identified the major portion of the collected Coleoptera from the traps operating in the forest, and he also produced valuable faunistic data. In Egypt, Hafez and Bishara (1961) pointed out that more numbers of *Pentodon bispinesus* kust. were attracted to light trap fitted with ultra-violet lamp than those at ordinary light. Genung (1972) reported that the adult's elaterids showed specific responses to black light traps and sticky traps during seasonal occurrence studies. Both types of traps are therefore needed for broad spectrum studies of elaterid populations. James *et. al.* (1995) reported that traps baited with synthetic aggregation pheromones of *Carpophilus hemipterus* (L.), *C. mutilatus* Erichson and *C. davidsoni* Dobson and fermenting bread dough were used to identify the fauna monitor seasonal abundance of nitidulids in orchards in four stone fruit growing regions of southeastern Australia [Shepparton, Cobran(Victoria), Renmark (South Australia), Windsor (New south Wales)]. Yahiro and Yano (1997) study the species composition and long-term fluctuation of ground beetles attracted to a light trap operated at Yamaguchi University Farm for 10 years were analyzed. Bertone (2004) studies the Dung beetles species composition and seasonal distribution within two distinct regions of North Carolina. Buss (2006) studies the seasonal abundance of phytophagous scarabs in Gainesville and Fort Lauderdale, Florida, was documented with ultraviolet black light traps operated from April 2002 to November 2004. Da Silva (2008) reported that ground beetles were used to monitor biodiversity along a gradient of land- use disturbance, from old-growth cork-oak woodland to a monoculture, in a typical Mediterranean landscape. The work also included an exotic forest in the second year.

MATERIALS AND METHODS

The present work was carried out in Qena Governorate (610 Km, southern Cairo), Fig (1) for two years, (from March, 2007 to February, 2009). The survey was carried out in the experimental farm of Agriculture Faculty, Qena. This area has been cultivated with wheat, clover, corn, alfalfa, vegetables and some ornamental plants.

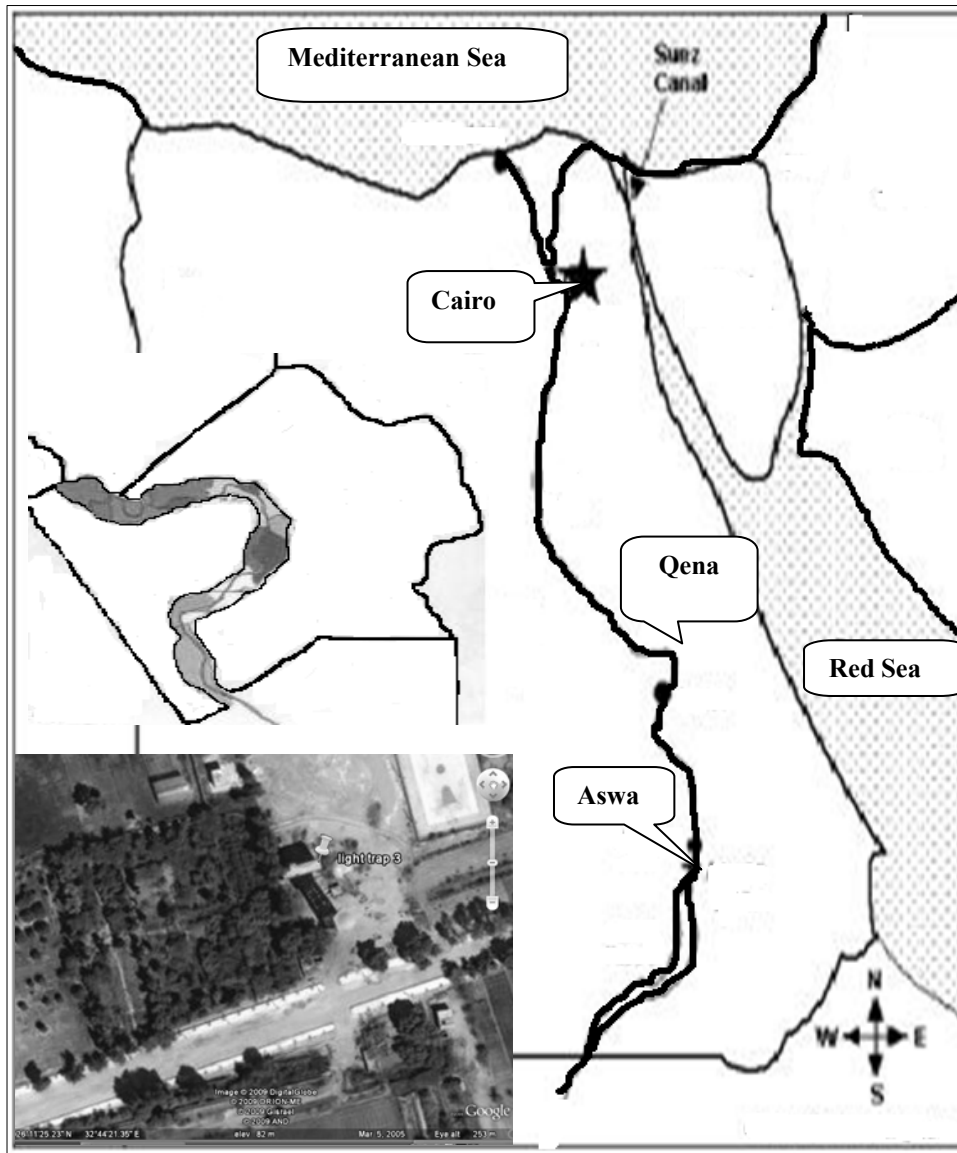


Fig (1): Egypt map showing study site in South Valley University, Qena.

Sampling methods:

Four light traps Fig (2) were operated from sunset to sunrise once every three nights. Records were made (from March 2007 to February 2009) by the first light trap (A) and (from March 2008 to February 2009) by traps (B, C, D). The traps were divided into two groups; each group contains two types of light traps. First group, containing traps (A & C) of Robinson mercury vapor light trap fitted with 250 watt bulb (Philips HPL type 57236 G/97), at (latitude $26^{\circ}11'25.18''N$ and longitude $32^{\circ}44'21.08''E$). Second group, containing traps (B & D) of “Jermy-type” light trap at (latitude $26^{\circ}11'24.79''N$ and longitude $32^{\circ}44'20.61''E$), this trap is constructed in 1952 by JERMY, there is a circular roof with diameter of 1 meter fixed to column at two meters above the ground level, the light source (light bulb and lamp-holder) is hung on the lower side of the roof. The function of the roof is to protect the lamp and captured insect's material from rain. Below the light source is a metal funnel place 40 cm below the roof. The upper end of the funnel is 50 cm in diameter and it tapers to 5 cm in diameter, leading to a killing jar. Killing box, containing sodium cyanide, was placed beneath the mouth of the traps. Jermy (1961)

Identification:

The Coleoptera species were identified in the Department of Entomology, Faculty of science, Cairo of University.



Jermey- type (A&C)



Robinson mercury vapor type (B&D)



Robinson mercury vapor type and Jermey type light traps above the roof of Irrigation station (Building No.C571).

Fig (2): Robinson mercury vapor type and Jermey type light traps

RESULTS AND DISCUSSION

CATCHES

Table (1) showed that, forty eight species belonging to forty three genera were identified. These genera were arranged into eighteen families. Scarabaeidae includes 9 species, Tenebrionidae includes 7 species, whereas Staphylinidae, Elateridae and Carabidae includes 4 species . On other hand, the remaining thirteen families includes between 1-3 species. The total catches were over (40.000 individuals).

Table (1): The number of species belonging to each family.

Families	Number of species
1- Scarabaeidae	9
2- Tenebrionidae	7
3- Carabidae	4
4- Elateridae	4
5- Staphylinidae	4
6- Curculionidae	3
7- Hydrophilidae	3
8- Bostrichidae	2
9- Cleridae	2
10- Anobiidae	1
11- Anthicidae	1
12- Bruchidae	1
13- Cucujidae	1
14- Dermestidae	1
15- Dytiscidae	1
16- Lathridiidae	1
17- Mordellidae	1
18- Myleridae	1

Table (2) showed that, the most abundance species was *Tachyura lucasi* (Jacquelin du Val, 1852) of which 8206 individuals were captured, this species formed 20.12 % of the total catch of the first year. Aly (1981) by light trap found that eighty three species belonging to seventy genera. These genera were arranged into twenty three families. Carabidae and Tenebrionidae each include 12 species, whereas Scarabaeidae, Dytiscidae, Staphylinidae and hydrophilidae includes nine, seven, six and five species, respectively. On other hand, the remaining 17 families includes between 1-3 species. The total catches were over 76.000 individuals. The most abundance species was *Tachys fumigatus* Sch. Of which over 23.000 individuals were captured, this species formed 31.23% of the total catch. Mohamed (1997) reported that, Coleoptera included species belonging to 8 genera and 6 families. The total catches were over 3000 individuals. The most abundant species was *Coccinella undecimpunctata* of which over 1800 individuals were trapped. Yahiro and Yano (1997) reported that, a total of 60,532 individuals belonging to 77 species of Omopronidae, Carabidae and Brachinidae were collected by light trap. Berton (2004) reported that, trapping yielded 4,111 beetles representing 14 species from the piedmont dairy. Totals of 57,026 beetles representing 28 species and 28,857 beetles representing 26 species were trapped from the dairy unit and beef unit in costal plain. The introduced beetles *Onthophagus Taurus* Schreber accounted for more than 50% of the total beetles caught at both sites. Buss (2006), reported that over 44,000 adults of Scarabs were trapped, including 30 species from 14 genera. Da Silva, *et al.*, (2008), reported that a total of

11,294 individuals from 101 species. The most common species recorded in both years were *Campalita maderae* and *Pesudophonus rufipes*.

Table (2): Catches of certain species of Order Coleoptera over a period of two trapping years by using Light traps (A, B, C and D) (2007-2008) and (2008-2009) :

Families and species	year	2008-2009				Total	%	
	Trap	A	B	C	D			
Anobiidae								
<i>Lasioderma baudii</i> Schilsky,1899		227	585	601	6	4	1423	3.49
Anthicidae								
<i>Anthicus crinitus</i> La Ferte, 1848		1404	764	2244	304	251	4967	12.18
Bostrichidae								
<i>Bostrychophilus zickeli</i> (Marseul,1867)		3	3	4	3	2	15	0.04
<i>Dinoderus bifoveolatus</i> (Wollaston, 1858)		0	70	70	4	1	145	0.36
<i>Rizopertha dominica</i> Fabricius,1775		19	117	65	16	4	221	0.54
Bruchidae								
<i>Bruchidius incarnates</i> (Bohemann, 1833)		2	2	0	0	1	5	0.01
Carabidae								
<i>Bembidion niloticum</i> Dejean, 1831		8	43	142	71	98	362	0.89
<i>Stenolophus marginata</i> Dejean, 1829		852	2379	1420	103	112	4866	11.93
<i>Myriochile melancholica</i> (Fabricius, 1798)		1	8	4	2	1	16	0.04
<i>Tachyura lucasi</i> (Jacquelin du Val, 1852)		1508	2244	3820	370	264	8206	20.12
Cleridae								
<i>Necrobia rufipes</i> (De Geer, 1775)		0	0	1	0	0	1	0.002
<i>Tillodenops plagiatus</i> (Fairm., 1892)		0	0	0	3	3	6	0.01
Cucujidae								
<i>Oryzaephilus surinamensis</i> (Linnaeus, 1758)		10	69	151	5	5	240	0.59
Curculionidae								
<i>Microlarinus humeralis</i> (Tournier,1873)		0	2	2	0	0	4	0.010
<i>Micronyx rufipennis</i> (Tournier,1874)		16	71	54	14	8	163	0.4
Dermestidae								
<i>Attagenus scalaris</i> (Pic, 1893)		0	6	0	0	0	6	0.015
Dytiscidae								
<i>Hydaticus leander</i> (Rossi, 1790)		26	18	7	3	10	64	0.16
Elateridae								
<i>Cardiophorus humilis</i> Erichson,1840		1	14	30	1	2	48	0.12
<i>Drasterius figuratus</i> Germar		717	1172	1283	156	101	3429	8.41
<i>Lanelater notodonta</i> (Latreille, 1823)		0	6	9	3	2	20	0.05
<i>Tillodenops plagiatus</i> (Fairm., 1892)		0	0	0	3	3	6	0.015
Hydrophilidae								
<i>Enochrus bicolor</i> (Fabricius)		8	15	20	9	3	55	0.13
<i>Laccobius leucaspis</i> Kiesenwetter 1870.		34	29	60	34	6	163	0.4
<i>Sternolophus rufipes</i> Fabricius, 1792		0	0	8	1	6	15	0.04
Lathridiidae								
<i>Corticaria fulva</i> (Comolli, 1837)		613	816	1283	53	96	2861	7.01
Mordellidae								
<i>Anthobates defarguesi</i> unifaciata chabout		0	9	10	0	5	24	0.06
Myleridae								
<i>Melyris oblonga</i> (Fabricius,1775)		0	0	0	0	2	2	0.005
Scarabaeidae								
<i>Adoretus garamas</i> Peyerhimhoff, 1921		18	42	6	3	0	69	0.17
<i>Aphodius desertus</i> Klug, 1845		786	643	582	62	13	2086	5.11
<i>Aphodius</i>		13	7	11	21	19	71	0.17
<i>Eremazus unistriatus</i> Mulsant, 1851		17	8	30	41	10	106	0.26
<i>Hybosorus illigeri</i> Reiche, 1853		217	206	198	27	15	663	1.63
<i>Ontophagus sellatus</i> (Klug, 1845)		0	41	2	0	0	43	0.11
<i>Pentodon bispinosus</i> Kust		6	23	13	0	3	45	0.11
<i>Rhysssemus goudoti</i> Harold, 1869		944	1211	1083	54	29	3292	8.1
<i>Schizonychia nilotica</i> Blanch, 1850		4	3	0	0	0	7	0.02
Staphylinidae								
<i>Atheta gregaria</i> (Casey,1856)		389	258	709	87	89	1532	3.76
<i>Paederus alfieri</i> Koch, 1934		0	3	1	157	74	253	0.58
<i>Philonthus quisquiliarius</i> (Gyllenhal,1810)		819	1244	1473	138	84	3758	9.21
<i>Philonthus turbidus</i> Erichson, 1839		655	229	253	19	36	1192	2.92
Tenebrionidae								
<i>Alphitobius diaperinus</i> (Panzer, 1797)		11	2	7	31	29	80	0.20
<i>Alphitobius laevigatus</i> (Fabricius, 1781)		8	8	11	24	6	57	0.14
<i>Gonocephalum patruale</i> Erichson, 1843		0	1	0	2	2	5	0.01
<i>Gonocephalum setulosum</i> Faldermann, 1837		1	2	6	82	30	121	0.3
<i>Himatismus villosus</i> Hagg-Rutenberg, 1870		2	9	9	7	3	30	0.07
<i>Phtora aegyptiaca</i> (Reitter,1899)		0	5	14	5	2	26	0.06
<i>Phtora apicalaervis</i> (Marseul, 1876)		2	3	14	0	2	21	0.051
Total number of species		9342	12383	15710	1924	1436	40795	100

Annual fluctuations:

The monthly abundance of all Coleoptera for two trapping years (2007-2008 and 2008-2009) as shown in table (3).

Table (3): Monthly abundance and percentage of all coleopterous insects over a period of two trapping years

Order Coleoptera:

The largest number of Coleoptera was recorded in September at trap (A) of

Species	year	Trap	March	April	May	June	July	August	September	October	November	December	January	February	%
All Coleoptera	2007-2008	A	103	525	1224	1676	1379	1737	2011	335	10	0	0	0	23.42
		B	798	1058	932	1989	936	2976	2986	705	21	0	0	0	24.08
	2008-2009	B	189	191	114	259	157	357	250	373	13	0	0	0	18.58
		C	1243	1219	1405	1775	2271	4729	2056	1002	21	0	0	0	30.10
		D	152	154	54	242	176	228	148	265	14	0	0	0	18.49

the two years representing 23.42%, 24.08% of the total number of individuals in this trap, in August at traps (B and C) representing 18.58% , 30.10% of the total number of individuals in each trap, respectively , and in October at trap (D) representing 18.49% of the total number of individuals in this trap . On other hand the lowest numbers of individuals were recorded in November at all traps for the two trapping years. Whereas, there are no catches recorded in December, January and February, Fig (3).

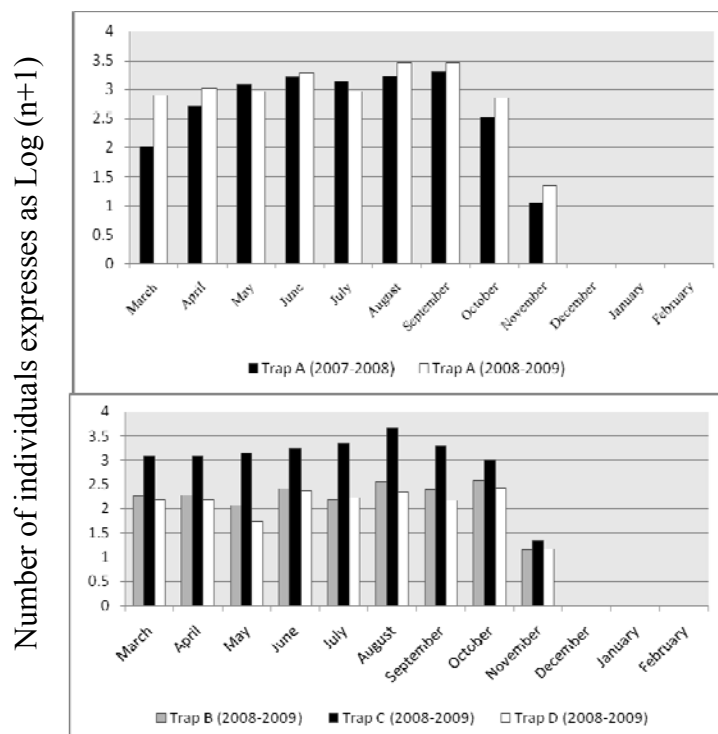


Fig (3): Monthly distribution of all coleopterous insects which collected by traps (A, B, C and D).
 Trap A: the first and second years (2007-2009).
 Traps B, C and D: The second year (2008-2009).

The results indicate that, the highest population of order Coleoptera in all traps was recorded in August at trap (C). On other hand, the lowest numbers of individuals

were recorded in November at all traps for the two trapping years. This result approximately agrees with, Aly (1981) reported that the highest population of order Coleoptera was recorded in September 1977-78, and lowest numbers of individuals were recorded in January of the first year and December of the second year. Mohamed (1997) reported that, the highest population of order Coleoptera collectively in all stations studied was recorded in March and April in the two trapping years, and the lowest populations collectively in all stations were recorded during November in the first year and during February in the second year.

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ARABIC SUMMERY

دراسة فصيلة من غمدية الأجنحة باستخدام نوعين من المصائد علي ارتفاعين مختلفين

محمد زكي يوسف - ابراهيم عيسي عيسي - عمرو محمد بدوي
قسم علم الحيوان - كلية العلوم - جامعة جنوب الوادي بقنا

استخدمت نوعين من المصائد الضوئية (روبسون و جيريبي) علي ارتفاعين مختلفين لمدة عامين متتالين في مزرعة كلية الزراعة بجامعة جنوب الوادي بمدينة قنا.

تمت دراسة التوزيع الموسمي للرتبة وأمكن التعرف علي ثمانية واربعون نوعا من رتبة غمدية الأجنحة تنتمي الي ثلاثة وأربعون جنس تنتحي الي ثمانية عشر فصيلة، وكان اكثر الأنواع شيوعا تاكيورا لوكاسي حيث جمع منه اكثر من ثمانية الاف حشرة خلال فترة التجميع , حيث مثل هذا النوع حوالي ٢٠.١٢% من مجموع الرتبة ككل.