

OCURRENCE AND POPULATION DENSITY OF LEPIDOPTEROUS MOTHS AT BENI-SUEF GOVERNORATE, EGYPT

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(Manuscript received 7 April 2008)

Abstract

Observations and a population density of lepidopterous moths were carried out at Seds Agriculture Research Station district, Beni-Suef Governorate throughout complete one year (January, 2005 – December, 2005) by using an ordinary light-trap. Ninety-three lepidopterous species belonging to sixty-seven genera under fourteen families were trapped with a total number of 34588 moths through the year. The largest numbers of species was found in the Noctuidae (40 species), followed by family Pyralidae (14 species), however family Pyraustidae (10 species) came in the third rank. The highest number of moths were captured during July (6408 moths) and the lowest one (211) was obtained during Janury. Family Noctuidae was the most abundant through the year (69.05 % of the total lepidopterous catch), while a lot of recorded families were caught in less numbers. The noctuid, *Spodoptera littoralis* (Boisd.), was the most abundant species in the year of study, constituting 23,88% of the total lepidopterous catch. Its highest monthly number was obtained in August.

INTRODUCTION

Study of population of certain insect groups of economic importance such as moths, butterflies, beetles, bugs...etc. in a local area has a great value in the integrated pest management programs in this area.

The present work has been done, using a light trap, in order to survey and study the population density, and relative abundance of population of lepidopterous moths in Seds station (Beni-Suef Governorate). Frost (1952), Hosny (1953), Hassanein (1956), Hosny and Khattab (1960), Glick and Graham (1961 & 1965), Parencia *et al.* (1962), Graham (1964), Hanna and Atries (1969), Hassanein *et al.* (1971), Hanna *et al.* (1975), Ibrahim (1977), Popescu *et al.* (1977), El-Kady *et al.* (1980), Badr *et al.* (1985, 1987), Zanaty *et al.* (1985) and Salem *et al.* (1989) carried out reported similar studies on this group of insects.

MATERIALS AND METHODS

The observations and population study on lepidopterous moths at Seds region (Beni-Suef Governorate) were made using an ordinary light trap provided with 250 watts clear mercury vapour lamp. The trap was placed three meters high above the ground in an open farm cultivated with vegetables and field crops, and was operated twice a week from sunset to sunrise, along one year (January, 2005 – December, 2005).

Moths were separated from the periodic catches, sorted, identified, counted and recorded. The total monthly and annual catch for each family and species were presented in tables together with their percentages of prevalence. Taxa (families, genera and species) are alphabetically arranged. Identification and counts were taken place at the Classification Department, Plant Protection Research Institute, Egypt. The specimens were examined and identified in the collection of Plant Protection Research Institute, Ministry of Agriculture.

RESULTS AND DISCUSSION

Data obtained from the light-trap catches and tabulated in tables 1, 2 indicated that 34588 specimens were captured in the year of study. These moths belonged to 93 species of 67 genera and 14 lepidopterous families, that are: Arctiidae, Cosmopterygidae, Cossidae, Gelechiidae, Geometridae, Lasiocampidae, Lemonidae, Noctuidae, Pyralidae, Pyraustidae, Sphingidae, Tineidae, Tortricidae, Plutellidae.

The total number of trapped moths throughout the year from January to December was 34588 individual moths, most of them were trapped during late spring and summer months. The largest number was obtained during July (6408 moths) representing 18.53% of the total annual catch. followed by august (6271 moths) constituting 18.13 % and then September (5735 moths representing 16.58%). June representing 13.65% of the total catch, May 11.23%, April 7.451% the least numbers were obtained during November (1.76%), February (1.67%) December (0.63%) and then January, (0.61%) .

Family Noctuidae included the largest number of species (40 species), and in number of individuals 23883 moths constituting 69.05% of the total catch. the peak of noctuid moths was observed during August (4581 moths) and the lowest number was during January (152 moths). the cotton leaf worm, *spodoptera littoralis* (Boisd.) was the most abundant species of families. A number of 8261 moths of this species

was trapped during the entire period of study . The peak was during August (2431 moths). *Spodoptera exigua* (H.) came next in abundance with 2432 moths / year, followed by *Syngrapha circumflexa* (L.) (1671 moths / year). *Spodoptera latebrosa* Led. and *pseudaletia unipuncta* (Haw.) were also trapped in relatively high number (1206 and 1197 moths) other noctuid species were less abundant (table 1)

Moths of family Pyralidae came next in abundance 4319 moths / year, representing 12.49% of the total catch . Higher number were trapped during May – September .The peak was during July (872 moths) and the lowest number was recorded during December and January (19 moths) . This family was represented by fourteen species in the catch, *Ancylosis hellenica* Staud. , *Anerastia nitidicostella* Rag. , *Bazaria fulvofaciata* Rag ., *Chilo agamemnon* Blez. , *Epischnia illotella* Zeller , *Etiella zinckenella* Treit., *Euchromius cambridgei* Zeller , *Euchromius ocella* (Haw.) , *Euchromius ramburiellus* (Dup.) , *Ezophera osseatella* (Treit.) , *Phycita diaphona* Staud. , *Schoenobius niloticus* Zeller , *Staudungeria fractifascilla* Rag., *Syria biflexella* Led. . The species *Schoenobius niloticus* Zeller was the most abundant within that reached to family (770 moths / year) its peak during August (199 moths) followed by the species , *Etiella zinckenella* Treit. (736 moths / year) , with its peak during July (257 moths) . *Staudungeria fractifasciella* Rag. came the lost and comprising 29 moths / year with the maximum number during May (8 moths) .

Pyraustid moths followed pyralids in abundance with total catch of 3959 moths / year , constituting 11.45% of the total lepidopterous catch .The largest number being trapped during June – July , whereas the lowest number were captured during December – January .

The peak was in July (954 moths) . As for family pyralidae it was represented by ten species , the most abundant one was *Pyrausta aurata* Staud. (1528 moths / year) , followed by *Nomophila noctuella* (D. & S.) (604 moths / year). Other pyraustid species were less abundant and less active . *Pyrausta aurata* Staud.was quite prevalent during July and June and disappeared in January and February. Individuals of *Nomophila noctuella* (D. & S.) were trapped all the year in relatively large numbers.

Family Geometridae was represented by seven species with a total number of 671 moths / year and were mostly active during June – August , disappearing during January. *Scopula ochroleucaria* (H. – S.) was the most abundant species of the family. A number of 174 moths of this species was trapped . The peak was during August (42 moths) . *Scopula donovani* (Distant) come next in abundance with 171 moths / year , followed by *Scopula coenosaria luridata* (Zeller) (102 moths / year) and then

Rhodometra sacraria L. (85 moths / year). Other geometrid species were less abundant (table 1) .

Family Sphingidae was represented by seven species with a total annual number of 460 moths, Representing 1.33% of the total lepidopterous catch .

Family Plutellidae was represented by only species *Plutella xylostella* L. with a total annual number of 394 moths , representing 1.14% of the total lepidopterous catch . this species was active from June – September disappearing during January .

Families , Tortricidae , Gelechiidae , Arctiidae, Cossidae, Cosmopterygidae, Lemonidae, Lasiocampidae and Tineidae constituted 0.61, 0.43 , 0.33 , 0.31 , 0.27 , 0.27 , 0.22 and 0.17 % of the total lepidopterous catch , respectively . Family Tortricidae was represented by three species with a total annual number of 210 moths . Each species was trapped in relatively low number . Family Gelechiidae was represented by one species with a total number of 149 moths / year . Family Arctiidae was represented by one species with a total number of 113 moths / year . On the other hand of families Lemonidae , Lasiocampidae and Tineidae were the least in number of individuals among lepidopterous moths and representing 0.27 , 0.22 , 0.17 % of the total annual catch .

Table 1 . TOTAL MONTHLY CATCH OF Moths AT BENI SUEF LOCATION DURING 2005

FAMILY	SPECIES	jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Des.	total	%
Arctiidae	<i>Utetheisa pulchella</i> Linnaeus	0	0	6	13	15	11	40	12	6	8	2	0	113	0.33
Cosmopterigidae	<i>Cosmopterix mimetes</i> Meyrick	0	0	1	3	5	8	4	6	2	0	0	0	29	0.08
	<i>Pyroderces coridophaga</i> Meyrick	0	0	0	1	5	4	6	4	9	2	0	0	31	0.09
	<i>Pyroderces simplex</i> (Walsingham)	0	0	1	4	7	2	8	6	5	0	0	0	33	0.10
Cossidae	<i>Paropta paradoxa</i> (Herrich- Schaffer)	0	0	0	0	1	4	5	8	4	1	0	0	23	0.07
	<i>Phragmataecia castanea</i> Hubner	0	0	1	2	4	5	9	12	8	3	0	0	44	0.13
	<i>Zeuzera pyrina</i> Linnaeus	0	0	0	1	3	5	9	15	8	0	0	0	41	0.12
Gelechiidae	<i>Pectinophora gossypiella</i> (Saunders)	0	0	7	29	11	15	26	19	33	4	5	0	149	0.43
Geometridae	<i>Chlorissa faustinata</i> Milliere	0	0	1	7	11	18	9	6	4	2	0	0	58	0.17
	<i>Idaea fractilineata</i> Zeller	0	0	0	3	2	5	8	9	7	4	1	0	39	0.11
	<i>Idaea mareotica</i> Draudt	0	0	0	4	6	9	7	12	3	1	1	0	43	0.12
	<i>Rhodometra sacraria</i> Linnaeus	0	0	3	10	11	14	19	12	7	4	2	3	85	0.25
	<i>Scopula coenosaria luridata</i> (Zeller)	0	1	8	6	11	22	25	16	8	3	1	0	101	0.29
	<i>Scopula donovani</i> (Distant)	0	1	4	6	19	31	24	35	27	16	8	0	171	0.49
	<i>Scopula ochroleucaria</i> (Herrich - Schaffer)	0	0	8	12	18	24	38	42	22	8	2	0	174	0.50
Lasiocampidae	<i>Taragma acaciae</i> Klug	0	0	0	1	0	6	19	24	18	8	0	0	76	0.22
Lemonidae	<i>Lemonis philopalus</i> Panz	0	3	6	9	13	18	11	19	6	4	5	0	94	0.27
Noctuidae	<i>Agrotis ipsilon</i> (Hufnagel)	0	37	183	186	221	288	228	23	19	6	4	0	1195	3.45
	<i>Agrotis pierretti</i> (Bugnion)	0	0	0	0	4	6	7	3	0	0	0	0	20	0.06

cont. table 1

FAMILY	SPECIES	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Des.	total	%
	<i>Agrotis puta</i> (Hubner)	0	0	0	0	8	12	15	0	0	0	12	3	50	0.14
	<i>Agrotis ripae</i> Baker	0	0	0	2	4	3	2	1	0	1	0	0	13	0.04
	<i>Agrotis spinifera</i> (Hubner)	0	33	30	35	52	61	53	37	29	1	0	0	331	0.96
	<i>Agrotis trux</i> Hubner	0	0	0	0	0	0	0	0	0	1	0	0	1	0.00
	<i>Athetis atriluna</i> Guenee	2	7	29	61	87	95	121	158	99	12	3	0	674	1.95
	<i>Athetis clavipalpis</i> Scopoli	4	9	44	59	65	74	111	97	85	7	0	0	555	1.60
	<i>Autographa gamma</i> Linnaeus	21	23	55	119	138	117	80	45	29	0	0	13	640	1.85
	<i>Brachygalae albolineata</i> Blachier	0	0	0	0	0	0	0	1	0	0	0	0	1	0.00
	<i>Chrysodeixis chalcitis</i> (Esper)	0	9	14	17	20	29	38	50	63	36	12	0	288	0.83
	<i>Earias insulana</i> Boisduval	0	7	5	16	10	4	29	14	25	61	15	1	187	0.54
	<i>Eublemma ecthaemata</i> (Hampson)	1	0	2	15	6	18	10	5	7	0	0	2	66	0.19
	<i>Eublemma gayner</i> Rothschild	0	0	1	8	18	15	13	4	7	14	2	0	82	0.24
	<i>Eublemma ostrina</i> (Hubner)	0	4	5	11	9	11	9	10	18	3	7	10	97	0.28
	<i>Eublemma parva</i> (Hubner)	0	0	0	1	4	7	16	10	5	3	2	0	48	0.14
	<i>Eublemma scitula</i> (Rambur)	0	0	1	3	7	9	8	10	6	2	1	0	47	0.14
	<i>Grammodes bifasciata</i> Petagna	0	0	7	1	6	8	27	34	18	5	2	0	108	0.31
	<i>Heliothis armigera</i> Hubner	8	26	28	38	64	56	81	42	19	0	0	0	362	1.05
	<i>Heliothis nubigera</i> Herrich - Schaffer	0	2	16	53	64	43	22	10	11	5	2	0	228	0.66
	<i>Heliothis peltigera</i> Schiffermuller	0	1	9	47	86	111	66	13	5	4	0	0	342	0.99

cont. table 1

FAMILY	SPECIES	jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Des.	total	%
	<i>Leucanitis kabyalaria</i> Bang- Hass	0	0	0	4	13	11	23	6	14	2	0	0	73	0.21
	<i>Mythimna loreyi</i> (Duponchel)	0	2	5	34	71	57	62	53	32	27	16	5	364	1.05
	<i>Noctua pronupa</i> Linnaeus	21	11	1	33	57	16	8	14	6	25	65	35	292	0.84
	<i>Polia consanguis</i> (Guenee)	0	0	0	8	65	11	37	21	45	0	2	0	189	0.55
	<i>Polia spinaciae</i> Duponchel	1	2	14	55	32	94	88	23	15	4	0	0	328	0.95
	<i>Propsalta capensis</i> Guenee	0	0	2	9	16	7	11	28	26	12	1	0	112	0.32
	<i>Pseudaletia unipuncta</i> (Haworth)	0	44	85	101	112	179	120	191	199	99	67	0	1197	3.46
	<i>Scotogramma trifolii</i> (Hufnagel)	0	0	63	107	149	173	178	136	83	40	37	0	966	2.79
	<i>Sesamia cretica</i> (Lederer)	2	8	12	45	33	25	39	27	24	4	0	0	219	0.63
	<i>Soctia segetum</i> (Denis & schiffermuller)	0	7	33	45	53	38	28	20	25	4	0	0	253	0.73
	<i>Spodoptera exigua</i> (Hubner)	15	9	33	100	295	347	501	498	527	64	13	30	2432	7.03
	<i>Spodoptera latebrosa</i> Lederer	10	11	32	40	110	104	202	286	321	50	28	12	1206	3.49
	<i>Spodoptera littoralis</i> Boisduval	28	81	109	127	385	462	1518	2431	2200	859	30	31	8261	23.88
	<i>Syngrapha circumflexa</i> (Linnaeus)	33	71	64	381	350	292	245	168	61	5	1	0	1671	4.83
	<i>Tarache lucida</i> Fabricius	0	1	23	25	35	11	54	37	48	9	4	1	248	0.72
	<i>Thyanoplusia orichalcea</i> (F.)	2	6	6	15	35	35	36	6	24	17	11	0	193	0.56
	<i>Trichoplusia circumscripta</i> (Freyer)	0	0	8	31	39	12	18	27	38	23	5	0	201	0.58
	<i>Trichoplusia daubei</i> (Boisduval)	1	2	0	0	18	11	30	16	19	14	9	3	123	0.36
	<i>Trichoplusia ni</i> (Hubner)	3	3	1	23	45	33	22	26	17	21	19	7	220	0.64
Pyralidae	<i>Ancylosis hellenica</i> Staudinger	0	9	17	35	51	24	91	68	102	53	7	0	457	1.32

FAMILY	SPECIES	jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Des.	total	%
	<i>Anerastia nitidicostella</i> Ragonot	0	4	12	19	36	46	69	43	89	55	24	0	397	1.15
	<i>Bazaria fulvofasciata</i> Ragonot	0	0	2	9	11	15	24	15	7	3	0	0	86	0.25
	<i>Chilo agamemnon</i> Bleszyniski	0	0	6	12	28	31	61	94	78	17	0	0	327	0.95
	<i>Epischnia illotella</i> Zeller	0	0	0	4	2	12	7	11	6	2	0	0	44	0.13
	<i>Etiella zinckenella</i> Treitschke	0	0	0	15	23	88	257	208	129	5	7	4	736	2.13
	<i>Euchromius cambridgei</i> Zeller	13	15	20	25	31	67	39	71	60	10	16	0	367	1.06
	<i>Euchromius ocella</i> (Haworth)	0	7	22	16	95	77	79	56	32	27	5	2	418	1.21
	<i>Euchromius ramburiellus</i> (Duponchel)	5	19	30	47	69	117	99	44	72	23	17	1	543	1.57
	<i>Euzophera osseatella</i> (Treitschke)	0	0	1	4	8	7	10	3	2	0	0	0	35	0.10
	<i>Phycita diaphana</i> Staudinger	0	0	0	2	3	4	5	6	8	2	1	0	31	0.09
	<i>Schoenobius niloticus</i> Zeller	0	0	9	11	83	128	111	199	143	59	15	12	770	2.23
	<i>Staudungeria fractifasciella</i> Ragonot	0	0	0	4	8	6	2	5	3	1	0	0	29	0.08
	<i>Syria biflexella</i> Lederer	1	3	2	4	5	22	18	16	8	0	0	0	79	0.23
Pyraustidae	<i>Hellula undalis</i> (Fabricius)	0	0	1	2	1	4	12	3	9	6	0	0	38	0.11
	<i>Herpetogramma licarsisalis</i> (Walker)	6	3	18	25	32	58	76	62	93	23	4	1	401	1.16
	<i>Hymenia recurvalis</i> (Fabricius)	0	0	13	18	23	31	76	47	39	17	8	6	278	0.80
	<i>Lepidogma tamaricalis</i> Mn.	0	0	0	0	2	1	0	0	0	3	1	0	7	0.02
	<i>Noctuella floralis</i> (Hubner)	0	0	0	11	35	153	122	67	33	29	12	1	463	1.34
	<i>Nomophila noctuella</i> (Denis & Schiffermuller)	17	39	100	141	57	36	39	57	45	34	28	11	604	1.75

cont. table 1

FAMILY	SPECIES	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Des.	total	%
	<i>Oëobia ferrugalais</i> (Hubner)	0	0	0	0	1	1	4	11	5	2	4	0	28	0.08
	<i>Ostrinia nubilalis</i> (Hubner)	0	0	16	17	32	63	55	31	47	23	7	1	292	0.84
	<i>Pyrausta aurata</i> Staudinger	0	0	52	112	190	439	516	78	121	7	9	4	1528	4.42
	<i>Pyrausta sanguinalis</i> (Linnaeus)	0	8	15	25	36	48	54	59	66	9	0	0	320	0.93
Sphingidae	<i>Acherontia atropos</i> Linnaeus	0	15	9	1	1	6	5	3	2	6	4	2	54	0.16
	<i>Agrius convolvuli</i> Linnaeus	4	6	6	5	20	18	6	11	8	7	3	0	94	0.27
	<i>Daphnis nerii</i> Linnaeus	0	0	0	0	1	3	7	15	4	1	0	0	31	0.09
	<i>Hipption celeio</i> Linnaeus	0	6	8	4	9	18	16	13	12	7	5	0	98	0.28
	<i>Hyles lineata livornica</i> (F.)	11	8	6	3	6	13	8	2	13	7	10	2	89	0.26
	<i>Macroglossum stellatarum</i> Linnaeus	0	0	0	2	5	4	6	8	7	0	0	0	32	0.09
	<i>Theretra alecto</i> Linnaeus	0	1	5	2	9	8	14	6	11	4	2	0	62	0.18
Tineidae	<i>Trichophaga abruptella</i> Wolaston	0	0	4	7	6	5	9	13	12	3	0	0	59	0.17
Tortricidae	<i>Bactra lanceolana</i> (Hubner)	0	5	2	3	8	11	4	14	7	0	0	0	54	0.16
	<i>Bactra stagnicolana</i> Zeller	2	1	5	0	4	0	0	2	1	0	0	0	15	0.04
	<i>Cnephasia pumicana</i> Zeller	0	0	0	3	8	16	21	15	26	31	12	9	141	0.41
Plutellidae	<i>Plutella xylostella</i> Linnaeus	0	6	2	23	18	56	63	77	89	43	12	5	394	1.14
		211	576	1349	2577	3885	4722	6408	6271	5735	2027	610	217	34588	

Table 2. TOTAL MONTHLY catches and relative abundance of lepidopterous families at Beni Suef LOCALity DURING 2005

	jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Des.	total	%
Arctiidae	0	0	6	13	15	11	40	12	6	8	2	0	113	0.33
Cosmopterygidae	0	0	2	8	17	14	18	16	16	2	0	0	93	0.27
Cossidae	0	0	1	3	8	14	23	35	20	4	0	0	108	0.31
Gelechiidae	0	0	7	29	11	15	26	19	33	4	5	0	149	0.43
Geometridae	0	2	24	48	78	123	130	132	78	38	15	3	671	1.94
Lasiocampidae	0	0	0	1	0	6	19	24	18	8	0	0	76	0.22
Lemonidae	0	3	6	9	13	18	11	19	6	4	5	0	94	0.27
Noctuidae	152	416	920	1855	2786	2885	4156	4581	4169	1440	370	153	23883	69.05
Pyralidae	19	57	121	207	453	644	872	839	739	257	92	19	4319	12.49
Pyraustidae	23	50	215	351	409	834	954	415	458	153	73	24	3959	11.45
Sphingidae	15	36	34	17	51	70	62	58	57	32	24	4	460	1.33
Tineidae	0	0	4	7	6	5	9	13	12	3	0	0	59	0.17
Tortricidae	2	6	7	6	20	27	25	31	34	31	12	9	210	0.61
Plutellidae	0	6	2	23	18	56	63	77	89	43	12	5	394	1.14
Total	211	576	1349	2577	3885	4722	6408	6271	5735	2027	610	217	34588	100

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التواجد والكثافة العددية لفرشات حرشفية الأجنحة في محافظة بنى سويف - بمصر

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يستهدف البحث دراسة كثافة المجموع وتذبذب التعداد والوفرة الموسمية للفرشات من رتبة
حرشفية الأجنحة في محافظة بنى سويف بإستخدام مصيدة ضوئية من نوع روبنسون لمدة عام واحد
(يناير - ديسمبر ٢٠٠٥).

وقد أوضحت نتائج الحصر وجود ٩٣ نوعاً من الفرشات تتبع ٦٧ جنساً تمثل أربعة عشرة
فصيلة من رتبة حرشفية الأجنحة.

هذا وقد وصل إجمالي مجموع الفرشات خلال فترة الحصر حوالى ٣٤٥٨٨ فراشة وكانت
أكثر وفرة خلال شهور الصيف (يوليو ، أغسطس ، سبتمبر و مايو) على التوالي بينما إنخفضت
كثافة التعداد بشدة خلال شهور الشتاء (فبراير ، ديسمبر و يناير) .

وقد سجلت فرشات فصيلة نوكتويدى أعلى نسبة في مجموع الأنواع حيث بلغت ٤٠ نوعاً من
خلال ٢٣٨٨٣ فراشة تمثل ٦٩,٠٥ % من مجموع التعداد الكلى ، بينما سجلت فصيلة بيراليدى
الترتيب الثانى حيث بلغت نسبتها ١٢,٤٩ % تليها فصيلة بيروستيدي ١١,٤٥ % بينما سجلت
الفصائل الأخرى أعداداً أقل وبالتالي نسبياً أقل من الفصائل السابق ذكرها .

وبصفة عامة فقد أحتلت فراشة دودة ورق القطن أعلى كثافة في مجموع فرشات فصيلة
نوكتويدى حيث وصلت نسبتها ٣٥,٠٧ % من مجموع الفصيلة ، ٢٣,٨٨ % من المجموع الكلى
لفرشات حرشفية الأجنحة تليها في التعداد فراشة دودة ورق القطن الصغرى حيث بلغت نسبتها
٧,٠٣ % من المجموع الكلى لفرشات حرشفية الأجنحة.