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MITE FAUNA ASSOCIATED WITH SOME DOMESTIC AND WILD AGRICULTURAL ANIMALS AND THEIR HABITAT IN EGYPT

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ABSTRACT

Random samples were collected from Giza Qualubyia and Minufyia Governorates during summer, autumn and winter 2001. The collected samples were litter, poultry food and feather from chickens, ducks, pekeeny ducks, geese, rabbits (as a domestic animals) and quails, rozella birds, zebra birds and kockteel birds (as a wild animals which were in captivity). Mites belonging to twenty-seven families of four suborders; viz., Gamasida, Actinedida, Acaridida and Oribatida plus the hypopal stage of family Acaridae, were collected. Out of 27 families, 24, 14 and 11 were found in Qaliobia, Giza and Minufyia Governorates, respectively. However, number of mites, percentage of occurrence and dominance differentiated families in and between localities. Number of mites during autumn season was the highest representing 21 families followed by summer then winter. Hypopal stage represented about 20% of mite population in autumn season while no hypopal stage in summer but nil in winter. Litter harbored mites of all 27 families and hypopal stage which was not found in feather and food. The percentage of mites and hypopal stage was 89.39% in litter, followed by feather (9.51%) then food (1.1%). Only 6 and 5 families were found in food and feather respectively. Feather of Pekeeny ducks harbored 49.5% of mites while chicken's feather harbored 42.6%. The percentage of mites in leftover food was 89% while it was 11% in food before feeding. The most common mite families in this study were Acaridae, Glycyphagidae Pyroglyphidae, Cheyletidae, Ascidae and Dermanyssidae. Declaration of the role of the animals under investigation and their habitat as a source of stored product mites also the dominance of occurrence of the recorded mite families were discussed in details.

Keywords: Litter, Chicken, Ducks, Rabbits, Wild birds, Actinedida, Acaridida,

INTRODUCTION

Mites comprise a large and economic group of Arthropoda. They are found in almost every habitat available to animal life. Several species of feather mites of the families Analgidae, Proctophyllodidae and Psoroptoididae were collected

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from birds (**Sohn and Noh 1994; Mironov and Kopij 1996 & 1997 and Young-ShihMin *et al* 1999**). *Acarus siro*, occurs widely in feed of cows and pigs, reducing the palatability of feed for cows and the growth rate of pigs. *Tyrophagus longior* extracted from bird nests, while *Aleuroglyphus ovatus* was found in poultry feed (**Chmielewski, 1984 and Zaldivar *et al* 1988**). In Finland a survey revealed that more mites were found in cow houses than in hay stores and *Acarus siro* was the most abundant species in cow houses (**Leskinen *et al* 1987**).

In Egypt, **Abo-Taka (1996)** found 14 mite species belonging to 11 families (Acaridae, Glycyphagidae, Analgidae, Pyroglyphidae, Dermanyssidae, Macronyssidae, Laelapidae, Cheyletidae, Tarsonemidae, Trombiculidae and Cheyletiellidae) inhabiting houses of chicken, ducks and pigeon. Astigmatid mites were in the highest population while mesostigmatid mites were the lowest

Mites significantly affect the agriculture, food, health and physical comfort of all members of our society. Many of these cause problems to poultry and farm animals, either by feeding on their blood, tissue fluids and burrowing in the skin, or by transmitting serious diseases. Consequently, meat, milk and egg production is affected. The red mite, *Dermanyssus gallinae* is an example of poultry parasite that also injurious to man. It was recorded on domestic fowl, pigeons, sparrows and other birds (**Abo-Taka & Allam, 1997**). In recent years there has been an increasing awareness of dermatitis in humans and domestic animals. People who work in poultry farms or rearing color birds in captivity as well as those works with stored food products are suffering from irritating itch caused by mites.

Mites of stored food include species of direct effect, e.g., acarid mites, as well as predacious ones e.g., gamasid and actinedid mites. The presence of mites makes grains and their products unacceptable and unattractive to humans and livestock. Thus in a broad sense Acarina are polluters of human and animal food. There in the stored grain ecosystem may be one or more of the following: (i) energy transformer, (ii) grainvore, (iii) herbivore, (iv) predator or parasite and (v) scavenger. (**Sinha, 1979**).

The suborder Astigmata contains the most abundant and diverse group of mites occurring in stored product habitats. Although much is known concerning the biology and control of important pest species (**Hughes, 1976**), very little has been published on the evolutionary origins of stored product inhabiting Astigmata. The natural distribution of stored product pests could be one of the following categories. (i) mites associated with fruit or meat, that are not widely distributed, (ii) mites associated with field resources, and (iii) mites associated with nests of animals and birds. (**Barry, 1979**). Moreover, accumulated knowledge of the acari fauna associated with domestic and wild animals (mainly birds) is extremely poor as compared with other habitats. So the objectives of the present work are:

(1) Estimate the mite fauna associated with feathers, litter and poultry food before feeding (stored food) and leftover food of some domestic and wild agricultural animals in Giza, Qualubyia and Minufyia Governorates during summer, autumn and winter.

(2) Declare the role of the animals under investigation and their habitats as a source of mite pests to the stored products.

MATERIAL AND METHODS

Random samples were collected from Giza Qualubyia and Minufyia Governorates during summer, autumn and winter 2001. The collected samples were litter, poultry food and feather from chickens, ducks, pekeeny ducks, geese, rabbits (as a domestic animals) and quails, rozella birds, zebra birds and kockteel birds (as a wild animals which were in captivity).

1. Samples

a:- **Litters**: were taken from under hosts and were containing animal feces, feed powder, feather fragments and dust, each samples was about 500 g.

b:- **Feather:** were removed from alive animals, each sample was about 25 g.

c:- **Poultry food:** about 500 g. from the chicken food before feeding (stored food) and after feeding (leftover food) were taken.

All samples were collected from poultry farms, farmer's houses, and public houses then placed in plastic bags, tightly closed with rubber bands and transferred as soon as possible to the laboratory of the Plant Protection Department, Faculty of Agriculture Ain Shams University for mite extraction.

2. Extraction of mites

About 100 g. samples of litter animals, and chicken food singly mixed, and 25-gm feather samples were taken. The samples were spread over muslin in the Tullgren (modified Berlese) funnels in 2 cm. deep layers. The extracted mites were received in Petri dishes filled with about 25 cm. of tap water. Twenty-four hours later, extraction contents of the Petri dishes were examined using dissecting microscope. Adults and immature stages of mites were mounted on microscopic glass slides in modified Berlese fluid **(Schuster and Pritchard, 1963)** for identification and counting using light microscope. Number of mites per sample was attributed to one kilogram.

3. Identification of mites

Identification was carried out to the level of the family using keys erected by **Hughes (1976); Krantz (1978)** and **Zaher (1986).**

4. Dominance of occurrence

Dominance terminology used by **Cusack *et al* (1975)** was adopted. According to the total population of each family, the order of dominance was divided into three categories: dominant (+++), influent (++) and recedent (+)

RESULTS

1. Mite families inhabiting feather, litter and chicken food

Litters contained the highest average number of mites followed by those associated with feather and those inhabiting both stored and left over poultry food (Table, 1). However five mite families were extracted from feather of domestic and wild birds. These families were Acaridae, Ascidae, Cheyletidae,

Table 1. Average number, percentage of occurrence and dominance of mites associated with samples (1Kg. each) of different domestic and wild agricultural animal materials.

Family name	Feather			Litter			Food		
	Average/ Kg	% of occur-ance	Domi-nance	Average/ Kg	% of occur-ance	Domi-nance	Average/ Kg	% of occur-ance	Domi-nance
Acaridae	18	0.47	+	3365.9	9.29	+++	327	73.68	+++
Acarophenacidae				544	1.5	+			
Ameroseiidae				15	0.04	+			
Ascidae	183	4.75	+	1647	4.55	+++	20	4 51	+
Bdellidae				1041.4	2.88	++			
Cheyletidae	256.5	6.65	+	12680	35.01	+++	59.8	13.47	++
Chortoglyphidae				1183.8	3.27	++			
Cunaxidae				3	0.01	+			
Dermanyssidae				4071.5	11.24	+++			
Glycyphagidae	1845	47.86	+++	3418.5	9.44	+++			
Hypopal stage				4953.5	13.68	+++			
Laelapidae				2	0.01	+			
Macrochelidae				95	0.26	+			
Oribatulidae				44	0.12	+	16	3.61	+
Parasitidae				261	0.72	+			
Phytoseiidae				650.2	1.8	++			
Pyemotidae				9	0.02	+			
Pygmephoridae				127	0.35	+			
Pyroglyphidae	1552 3	40.27	+++	728	2.01	++	14	3.15	+
Raphignathidae				16.9	0.05	+			
Rhagidiidae				2	0.01	+			
Rhodacaridae				101.5	0.28	+			
Sarcoptidae				92	0.25	+			
Stigmaeidae				189	0.52	+			
Tarsonemidae				478	1.32	+			
Tetranychidae				33	0.09	+			
Tydeidae				453	1.25	+			
Uropodidae				9	0.03	+	7	1.58	+
Total	3854.8			36214.2			443.8		
%	9.51			89.39			1.1		
No. of Families	5			27			6		

Glycy phagidae, and Pyroglyphidae. Glycyphagidae and Pyroglyphidae proved to be "dominant" represent 47.86 % and 40.27 % of the total collected mites, respectively. The other three families were "resident" where they form from 0.47 % to 6.65 % of the total collected mites. Food samples sheltered six mite families i.e., Acaridae, Ascidae, Cheyletidae, Oribatulidae, Pyroglyphidae and Uropodidae. Acarid mites were considered to be "dominant" since they represented 73.68 % of the total collected mites. The cheyletid mites were "influent", represented by 13.47% of the total collected mites, while other families were "resident" where their population percentage ranged between 1.58% (Uropodidae) to 4.51% (Ascidae).

All mite families (27 families plus the acarid hypopal stage) were occurred in litter of the chosen domestic and wild agricultural animals. The "dominant" families were Acaridae, Ascidae, Cheyletidae, Dermanyssidae, Glycyphagidae, and the hypopal stage, representing 9.22 %, 4.55 %, 35.01 %, 11.24 %, 9.44 % and 13.68% of the total collected mites, respectively. Families Bdellidae, Chortoglyphidae, Phytoseiidae, and Pyroglyphidae were considered to be "influent" where they represented by 2.88%, 3.27%, 1.8% and 2.01 % of the total collected mites, respectively. The other mite families were "resident" since their population percentage ranged between 0.01 % (Cunaxidae, Laelapidae and Rhagidiidae) to 1.5% (Acarophenacidae).

Twenty families were found in litter only. One family (Glycyphagidae) was collected from both litter and feather. Two families (Oribatulidae and Uropodidae) were collected from both litter and food. Family Acaridae, Ascidae, Cheyletidae and Pyroglyphidae were found inhabiting feather, litter and food.

2. Mite families associated with samples of different domestic and wild agricultural animal materials collected from Giza, Minufyia and Qualubyia Governorates

The total average number of mites collected from Giza, Minufyia and Qualubyia Governorates were 6903.7, 11380.6 and 22228.5 mites, respectively. Data given in Table (2) indicates that samples collected from Giza Governorate sheltered 14 mite families plus the acarid hypopal stage. Of these 5 families (Acaridae, Acarophenacidae, Ascidae, Bidellidae and Cheyletidae plus the hypopal stage of the Acaridae were "dominant" where their population percentage ranged between 23.07% (Acaridae) and 7.88% (Acarophenacidae). The other nine families were "resident" where their population percentage ranged between 0.13% (Tarsonemidae) and 2.01% (Phytoseiidae).

Samples collected from Qualubyia Governorate sheltered 24 families plus the acarid hypopal stage. Six families were "dominant", with average population percentage ranging between 38.70 % (Cheyletidae) and 5.33% (Chortoglyphidae). Two families were "influent" (Phytoseiidae and Tarsonemidae) represented by 2.3%, and 2.1%, respectively. The other 17 families were "resident", and their population percentage ranged between 0.01% (Bdellidae, Laelapidae, and Rhagidiidae) and 1.34% (Family Ascidae).

Eleven Families were found in samples collected from Minufyia Governorate. Of these three families were

Table 2. Average number, percentage of occurrence and dominance of mites associated with litter, food samples (1Kg. each) of different domestic and wild agricultural animals collected from Giza, Minufyia and Qualubyia governorates.

Family name	Giza			Minufyia			Qualubyia		
	Average/ Kg	%of occur- ance	Domi- nance	Average/ Kg	%of occur- ance	Domi- nance	Average/ Kg	of% occur- ance	Domi- nance
Acaridae	1593	23.07	+++	309.2	2.72	+	1808.7	8.14	+++
Acarophenacidae	544	7.88	+++						
Ameroseiidae							15	0.07	+
Ascidae	1543	22.35	+++	10	0.09	+	297	1.34	+
Bdellidae	988	14.31	+++	50	0.44	+	3.4	0.01	+
Cheyletidae	638.2	9.24	+++	3755.5	33	+++	3602.6	38.7	+++
Chortoglyphidae							1183.8	5.33	+++
Cunaxidae				3	0.02	+			
Dermanyssidae				3897	34 24	+++	174.5	0.78	+
Glycyphagidae	100.5	1.46	+	2754	24.2	+++	2409	10.83	+++
Hypopal stage	1062	15.38	+++				3891.5	17.51	+++
Laelapidae							2	0.01	+
Macrochelidae	22	0.32	+				73	0.33	+
Oribatulidae				17	0.15	+	43	0.19	+
Parasitidae	101	1.46	+				160	0.72	+
Phytoseiidae	139	2.01	+				511.2	2.3	++
Pyemotidae							9	0.04	+
Pygmephoridae	48	0.7	+				79	0.35	+
Pyroglyphidae				176	1.55	+	2118.3	9.53	+++
Raphignathidae				16.9	0.15	+			
Rhagidiidae							2	0.01	+
Rhodacaridae	64	0.93	+				37.5	0.17	+
Sarcoptidae	26	0.38	+				66	0.3	+
Stigmaeidae							189	0.85	+
Tarsonemidae	9	0.13	+				469	2.11	++
Tetranychidae							33	0.15	+
Tydeidae	26	0.38	+	392	3.44	+	35	0.16	+
Uropodidae							16	0.07	+
Total	6903.7			11380.6			22228.5		
%	17.04			28.1			54.86		
No. of Families	14			11			24		

"dominant" (Dermanyssidae, Cheyletidae and Glycyphagidae), represented by 34.24%, 33.0% and 24.2%, respectively. The other eight families were considered "resident" where their population percentage ranged between 0.02 % (Cunaxidae) and 3.44 % (Tydeidae).

A. Mites found in samples collected from three Governorates

Acaridae, Ascidae, Bdellidae, Cheyletidae, Glycyphagidae and Tydeidae were associated with samples collected from Giza, Qualubyia and Minufyia Governorates.

B. Mites found in samples collected from two Governorates

Eight Families were found inhabiting samples collected from Giza and Qualubyia Governorates: Hypopal stage of Family Acaridae, Macrochelidae, Parasitidae, Phytoseiidae, Pygmephoridae, Rhodacaridae, Sarcoptidae and Tarsonemidae. Three families were found in Qualubyia and Minufyia Governorate (Dermanyssidae, Oribatulidae and Pyroglyphidae.

C. Mites found in samples collected from one Governorate

Family Acarophenacidae was found in Giza Governorate only; families Ameroseiidae, Chortoglyphidae, Laelapidae, Pyemotidae, Rhagidiidae, Stigmaeidae, Tetranychidae, and Uropodidae were found in Qualubyia Governorate only, and families Cunaxidae and Raphignathidae found in Minufyia only.

3. Mites associated with some domestic and wild agricultural animals during summer, autumn and winter

The average total number of mites collected during summer, autumn and winter were 9110.4, 24367.5 and 7034.9 mites, respectively (Table 3). During summer, 22 families were found associated with the examined materials. Six families of them (Acaridae, Ascidae, Cheyletidae, Chortoglyphidae, Pyroglyphidae and Tarsonemidae) were "dominant" and their population percentage ranged between 4.7% (Tarsonemidae), and 44.50% (Cheyletidae). The other families were "resident" where their population percentage ranged between 0.01% (Pyemotidae) and 2.10% (Stigmaeidae).

During autumn, 21 families were extracted plus the acarid hypopal stage. Four families (Acaridae, Cheyletidae, Dermanyssidae, Glycyphagidae) and hypopal stage of Acaridae were "dominant", and their population percentage ranged between 10.17 % (Acaridae) and 20.67 % (Cheyletidae). Four families (Ascidae, Phytoseiidae, Pyroglyphidae and Bdellidae) were "influent" where they were represented by 2.65 %, 2.67%, 2.82% and 4.26%, respectively. The rest were considered to be "resident" where their population percentage ranged between 0.01 % (Cunaxidae) and 2.22% (Acarophenacidae).

During winter, 8 families and the acarid hypopal stage were recorded. Two families were "dominant", Cheyletidae (55.51%) and Glycyphagidae (25.88%). Ascidae was considered to be "influent" (9.51%). The rest were "resident" and their population percentage ranged between 0.09% (Oribatulidae) and 1% (acarid hypopal stage).

Table 3. Average number, percentage of occurrence and dominance of mites associated with samples (1Kg each) of different domestic and wild agricultural animal materials during summer, autumn and winter.

Family name	Summer			Autumn			Winter		
	Average/ Kg	% of occur-ance	Domi-nance	Average/ Kg	% of occur-ance	Domi-nance	Average/ Kg	% of occur-ance	Domi-nance
Acaridae	748	8.21	+++	2477.9	10.17	+++	485	6.89	++
Acarophenacid	3	0.03	+	541	2.22	+			
Ameroseiidae	15	0.2	+						
Ascidae	536	5.9	+++	645	2.65	++	669	9.51	++
Bdellidae	3.4	0.04	+	1038	4.26	++			
Cheyletidae	4054.2	44.5	+++	5036.7	20.67	+++	3905.4	55.51	+++
Chortoglyphidae	1175	12.9	+++	8.8	0.04	+			
Cunaxidae				3	0.01	+			
Dermanyssidae	174.5	1.9	+	3897	15.99	+++			
Glycyphagidae	42	0.5	+	3401	13.96	+++	1820.5	25.88	+++
Hypopal stage				4883.5	20.04	+++	70	1	+
Laelapidae	2	0.02	+						
Macrochelidae	36	0.4	+	59	0.24	+			
Oribatulidae	28	0.3	+	26	0.11	+	6	0.09	+
Parasitidae				214	0.88	+	47	0.67	+
Phytoseiidae				650.2	2.67	++			
Pyemotidae	9	0.01	+						
Pygmephoridae	7	0.08	+	96	0.39	+	24	0.34	+
Pyroglyphidae	1607.3	17.6	+++	687	2.82	++			
Raphignathidae				16.9	0.07	+			
Rhagidiidae	2	0.02	+						
Rhodacaridae				101.5	0.42	+			
Sarcoptidae	2	0.02	+	90	0.37	+			
Stigmaeidae	189	2.1	+						
Tarsonemidae	426	4.7	+++	44	0.18	+	8	0.11	+
Tetranychidae	9	0.1	+	24	0.1	+			
Tydeidae	26	0.3	+	427	1.75	+			
Uropodidae	16	0.2	+						
Total	9110.4			24367.5			7034.9		
%	22.49			60.01			17.36		
No. of Families	22			21			8		

A-: Families occurred during the three seasons: Acaridae, Ascidae, Cheyletidae, Glycyphagidae, Oribatulidae, Pygmephoridae, and Tarsonemidae were recorded during summer, autumn and winter.

B-: Families occurred during two seasons: Acarophenacidae, Bdellidae, Chortoglyphidae, Dermanyssidae, Macrochelidae, Pyroglyphidae, [Sarcoptidae, Tetranychidae and Tydeidae were recorded during summer and autumn. The hypopal stage and family Parasitidae were recorded during autumn and winter.

C-: Families occurred during one season: The following families were recorded during summer months only: Ameroseiidae, Laelapidae, Pyemotidae, Rhagidiidae, Stigmaeidae, and Uropodidae. While Cunaxidae, Phytoseiidae, Raphignathidae and Rhodacaridae were found during autumn only.

4- Mites associated with feather of different domestic and wild agricultural birds

Data given in Table (4) show that five mite families were recorded associated with feather of the chosen domestic and wild agricultural birds. Three of them Cheyletidae, Acaridae and Glycyphagidae were found inhabiting feather of ducks pekeeny. Two families, Ascidae and Pyroglyphidae, were found inhabiting feather of chicken. Feather of ducks, geese, quails and zibra birds sheltered one family each. The highest average number of mites/Kg. (1544.3 pyroglyphid mites) was found inhabiting chickens feather, while the lowest number (8.0 pyroglyphid mites) extracted from ducks feather.

Table 4. Average number of mites associated with feather samples (1Kg each) of different domestic and wild agricultural birds

Family name	Birds						Total	Average/ Kg
	Chickens	Ducks	Pekeeny Ducks	Geese	Quail birds	Zebra birds		
Ascidae	100				83		183	91.5
Cheyletidae			45	80.5		131	256.5	85.5
Acaridae			18				18	18
Glycyphagidae			1845				1845	1845
Pyroglyphidae	1544.3	8					1552	776.35
Total	1644.3	8	1908	80.5	83	131	3854.8	
%	42.6	0.2	49.5	2.1	2.2	3.4		
No. of Families	2	1	3	1	1	1		

Family Cheyletidae was found to be associated with three feather types namely pekeeny ducks, geese and zebra birds. On the other hand, members of family Glycyphagidae though found in one type of feather, pekeeny ducks, yet they were represented by as high as 1845 mites/Kg. Family Acaridae was found inhabiting one type of feather, pekeeny ducks, (18 mites/Kg). The lowest average number of mites (8 pyroglyphids) was found associated with ducks feather. While the highest average number was recorded on pekeeny ducks (1845 glycyphagids).

5- Mites associated with litter of different domestic and wild agricultural animals

Data given in Table (5) show that litter of 9 domestic and wild agricultural animals was tested for mite families. The highest number of families (15) was recorded inhabiting litter of pigeons and rabbits. On the other hand, rozela litter sheltered only one family (Ascidae). The highest and lowest number of mites/Kg were recorded inhabiting litter of rabbits (9822.4 mites) and rozela (275 mites), respectively. Family Cheyletidae was found inhabiting all types of litter except rozela litter. The average number of mites/ Kg was 1585 individuals ranging between 70 (rabbits litter) to 8216.6 (chickens litter).

Family Acaridae was recorded in 7 types of litter with an average of 480.8 mites/Kg Families Ascidae, Glycyphagidae, Tarsonemidae and Tydeidae, were found inhabiting 6 types of litter with an average of 274.5, 569.8, 79.7 and 75.5 mites/Kg, respectively. Bdellidae, Dermanyssidae, Oribatulidae, Pygmephoridae and Pyroglyphidae, were collected from 3 types of litter with an average of 347.1, 1357.2, 14.7, 42.3, and 242.7 mites/Kg, respectively. Acarophenacidae, Chortoglyphidae, hypopal stage of Acaridae, Macrochelidae, Phytoseiidae, Sarcoptidae, Stigmaeidae, and Tetranychidae, were recorded in two types of litter with an average of mites/ Kg ranging between 16.5 (Tetranychidae) to 2476.8 (hypopal stage). The rest (9 families) were found in only one type of litter, with an average number of mites / Kg, ranging between 2 (Laelapidae and Rhagidiidae) to 261 (Parasitidae).

6- Mite families inhabiting chickens food before feeding and leftover food

Data given in Table (6) show that leftover food sheltered 6 families. Family Acaridae recorded the highest number of mites (311 mite/kg) followed by family Cheyletidae (27 mites/kg) while family Oribatulidae recorded the lowest one (7 mites/kg). Samples of food before feeding (stored food), contained only two families: Acaridae and Cheyletidae. The number of family Acaridae increased from 16 mites/kg in the food (before feeding) to 311 mites/kg in the leftover food, however there was an opposite trend with family Cheyletidae. Generally leftover food contained 89% of total mites while food before feeding contained 11%.

Table 5. Average number of mites associated with litter samples (1Kg. each) of different domestic and wild agricultural animals.

Family name	Animals										
	Chikens	Pegions	Ducks	Pekee-ny ducks	Geese	Rozella birds	Zebra birds	Kockte-el birds	Rabbits	total	Average / Kg
Acaridae	522	120	140.7	165.5	31			63	2323.7	3365.9	480.8
Acarophenacidae					3		541			544	272
Ameroseiidae					15					15	15
Ascidae			10		32	257	301	773.5	273.5	1647	274.5
Bdellidae		3.4		50			988			1041.4	347.1
Cheyletidae	8216.6	154.7	182.9	3472	125.3		218.5	240	70	12680	1585
Chortoglyphidae	25.8	1158								1183.8	591.9
Cunaxidae			3							3	3
Dermanyssidae	162	12.5	3897							4071.5	1357.2
Glycyphagidae	216	27	1840		854			100.5	381	33418.5	569.8
Hypopal stage	17								4936.5	4953.5	2476.8
Laelapidae		2								2	2
Macrochelidae		36							59	95	47.5
Oribatulidae	25	2	17							44	14.7
Parasitidae									261	261	261
Phytoseiidae			25						625.2	650.2	325.1
Pyemotidae	9									9	9
Pygmephoridae		7	24						96	127	42.3
Pyroglyphidae	49		168						511	728	242.7
Raphignathidae			16.9							16.9	16.9
Rhagidiidae		2								2	2
Rhodacaridae									101.5	101.5	101.5
Sarcoptidae		2							90	92	46
Stigmaeidae		104			85					189	94.5
Tarsonemidae	21	386	2		16		9		44	478	79.7
Tetranychidae	9								24	33	16.5
Tydeidae	9	18	292	100	8				26	453	75.5
Uropodidae	9									9	9
Total	9290.4	2034.6	6618.5	3787.5	1169.3	257	2057.5	1177	9822.4	36214.2	
%	25.7	5.6	18.3	10.5	3.2	0.7	5.7	3.3	27.1		
No. of Families	13	15	13	4	9	1	5	4	15		

Table 6. Average number of mites associated with food before feeding (stored food) and leftover poultry food per Kg. each.

Family name	Leftover food	Food before feeding	Total	Average/ Kg
Ascidae	20		20	20
Uropodidae	7		7	7
Cheyletidae	27	32.8	59.8	29.9
Acaridae	311	16	327	163.5
Pyroglyphidae	14		14	14
Oribatulidae	16		16	16
Total	395	48.8	443.8	
%	89	11		
No. of families	6	2		

DISCUSSION

The obtained data in Tables (1-3) indicated that there were 27 mite families plus hypopal stage of acarid mites collected from feather, litters and animal food during autumn, summer and winter seasons at three Governorates. The most abundant mite families were Acaridae, Cheyletidae, Dermanyssidae, Glycyphagidae in addition to acarid hypopal stage. Also the above-mentioned families recorded high number of mites within the tested materials especially litter. The present results supported by the finding of **Abo-Taka (1996)** who found that 14 mite species belonging to 11 families collected from chickens, ducks and pigeons farms in Egypt. Also **Corpuz-Raros *et al* (1988) and Rueda & Axtel (1997)** extracted 20 and 9 mite families collected from poultry houses in Philippines and USA respectively. Moreover they mentioned that the most common mites were acarids, cheyletids , glycypagids and dermanyssids. Regarding to the normal distribution of mites through the different seasons, it could be observed that the highest average number of mites recorded during autumn and summer. Similar results were obtained by **Leskinen *et al* (1987); El-Kammah *et al* (1990) and Abo-Taka (1996).**

Data in Tables (3-6) revealed that the highest average number of mites were recorded in the litter's of rabbits (9822.4), chickens, (9290.4) and ducks (6618.5). also the most abundant families were Acridae, Cheyletidae, Dermanyssidae, Chortoglyphidae, Glycyphagidae and the hypopal stage with an average number of mites ranged between 480.8 to 2476.8 mites/kg moreover the above-mentioned mite families recorded the highest number of mites in the litters of chickens, pigeons, ducks and rabbits than the other

litters (Table 5). Here again similar observation found by **El-Kammah *et al* (1990) and Abo-Taka (1996).**

The litters of wild birds which were in captivity contained a significant mite numbers of parasitic and predator groups of mite family i.e Acarophenacidae, Ascidae, Bdellidae and Cheyletidae. Meanwhile the acarid and Glycyphagid mites which consider as a stored product pests recorded the lowest numbers. Moreover the dermanyssid mites were not recorded too. (Table 5), this could be due to the presence of parasitic and predator mites or conteniously taking care by those birds. However the wild agriculture birds or their nests such as house sparrow contain more mite species and families. In study of mite fauna associated with *Passer domesticus niloticus* and *Streptopelia senegalensis aegyptiaca* in Sharkia and Qalyobia Governorates conducted by **Morsy *et al* (1999).** There were 31 species belonging to 23 genera, 17 families of mites associated with the previous hosts, in the same time the most common mite families were Dermanyssidae, Cheyletidae, Glycyphagidae, Acaridae and some other feather mites.

Regarding to the feather mites in the present work it is worthy to mention that there is no specific feather mites were recorded on neither domestic nor wild birds. On the other hand, the most common mites were stored product mites associated with domestic birds (Table 4).

Concerning the poultry food before and after feeding (Table 6), more mite families were present in the leftover food than the stored food (before feeding), furthermore the acarid mites significantly increased in number in the leftover food. The probability is more mite families with the respect of acarid mites transferred from the chickens litter to their food, so the mite of stored product could reach the store rooms attached with the poultry farms or in farmer's houses. About 50 species of mites occur in grain storage premises containing grains, flour, oilseed and animal feeding material, some of them also occur in bird or rodent nests and agricultural field. **(Sinha, 1979).** However, the largest group of stored product inhabiting genera is derived from nests of mammals especially rodents, followed by bird nests. The derivation of stored product mites from rodent nests is twofold. First, the nest materials itself provides a substrate for the specific fungi required as food by the mites, and second, a large number of rodents store various plant parts as food in chambers within their burrow system. **(Barry, 1979).** The previous observation strongly supports the present work. However, here again the highest number of stored product mites (Acaridae, Glycyphagidae, Pyroglyphidae, and the hypopal stage of Acaridae) was found in the litter of rabbits, chickens, pigeons and ducks, which have similar conditions as in the nests of rodents or birds. So the litters of domestic animals could be another major source of the stored product mites.

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الأكاروسات المصاحبة لبعض الحيوانات الزراعية البرية والمستأنسة وبيئاتها في مصر

[٣٢]

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١. قسم وقاية النبات - كلية الزراعة - جامعة عين شمس - شبرا الخيمة - القاهرة - مصر

١- تم جمع عينات عشوائية من محافظات الجيزة والقليوبية والمنوفية ، خلال الصيف والخريف والشتاء لعام ٢٠٠١ من فرشة وغذاء وريش الدجاج والبط والبط البكيني والأوز والحمام وكذلك فرشة الأرانب (كحيوانات مستأنسة). والسمان وطيور الزوزيلا والزبرا والكوكتيل (كحيوانات برية). وأظهرت النتائج وجود ٢٧ فصيلة أكاروس تابعة لرتيبات الجاماسيدا والأكتينيديدا والأكاريديدا والأوريباتيدا. بالإضافة إلي الطور الإرتحالي لفصيلة أكاريدي.

٢- وجدت ال ٢٧ فصيلة على النحو التالى ٢٤ فصيلة فى القليوبية ، ١٤ فصيلة فى الجيزة ، ١١ فصيلة فى المنوفية. وعموما كان عدد الأكاروسات ونسبة سيادتها مختلف بين الفصائل وكذلك بين المواقع.

٣- كان أعلى تعداد للأكاروسات فى فصل الخريف ممثلا فى ٢١ فصيلة ثم فى فصل الصيف و الشتاء.

٤- وجد الطور الارتحالى بنسبة ٢٠% من تعداد الأكاروسات فى فصل الخريف وكان غير موجود فى فصل الصيف ونادر الوجود فى فصل الشتاء.

٥- احتوت فرشة الحيوانات على ٢٧ فصيلة بالاضافة الى الطور الأرتحالى وهذا الطور لم يتم العثور علية فى الريش أو الغذاء.

٦- كانت نسبة تواجد الأكاروسات والطور الأرتحالى فى الفرشة ٣٩ ,٨٩ % وفى الريش ٥١ ,٩ % وفى الغذاء ١ ,١ %.

٧- كانت نسبة تواجد الأكاروسات ٥ ,٤٩% وفى ريش البط البكينى و٦ ,٤٢% فى ريش الدواجن.

٨ - كانت نسبة تواجد الأكاروسات فى الغذاء المتبقى ٨٩ % وفى الغذاء قبل التغذية ١ %.

٩- كانت فصائل الأكاريدي والكيليتيدي والجاميسيفاجيدي والبيروجليفيدي والأسكيدي والدرمنيسدى الأكثر سيادة وشيوعا.

وقد نوقش بالتفصيل بيان دور الحيوانات تحت الدراسة وبيئاتها كمصدر لأكاروسات المخازن وكذلك مدي هيمنة فصائل الأكاروسات التي سجل وجودها.

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