J. Pest Cont. & Environ. Sci. 14(2): 47 - 56 (2006).

Mites associated with some domestic and wild birds in Kafr El-Sheikh Governorate

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ABSTRACT

Mites associated externally with some of the common domestic and wild birds were surveyed in different habitats in Kafr El-Sheikh Governorate. The chicken (*Gallus gallus*), the duck, (*Anas* sp.) and the pigeon (*Columba livia*) were chosen to represent the domestic hosts, while the bulbul (*Pyconotus barbatus*), the common crow (*Corvus corone*) and Crested lark, *Galerida cristata* were selected to represent the wild hosts. Most birds are infested with different mites, which gradually increased among breeding season months. Generally, it could be concluded that 18 different species of mites were collected from domestic and wild birds mentioned before. These species belong to 3 different suborder and 12 families. Out of the numbers, 8 species belong to S.O. Astigmata and represent 5 families, while 6 and 4 species belonging to each of the Mesostigmata and prostigmata, respectively and representing four and three families in the two suborder, respectively. The incidence and rate of infestation of birds with different mite species during the present investigation were also recorded throughout months of breeding season 2005 (March-August). Data also revealed that the highest percent of infestation was recorded in *Columba livia* (85.7 %) followed by *Gallus gallus* (72.4 %) while *Pyconotus barbatus* was the lowest one (26.2 %). Number of mites associated with all hosts fluctuated among breeding season moths and gradually increased among breeding season to reach the maximum at the end of season (July, August), while the lowest numbers of mites / bird were recorded in March. On the other hand, the highest average number of mites was recorded in the samples collected from *Columba livia* (37.4 mites / bird) followed by *Gallus gallus* (23.3 mites / bird) and *Pyconotus barbatus* (12.1 mites / bird). Also, birds differ according to the number of mites inhabiting them among breeding season months.

Key words: Mites, domestic, wild, birds.

INTRODUCTION

Many birds are well known resident of cites, towns and rural areas. People may enjoy feeding or watching them. However, few people realize that birds are associated with several diseases of humans that a number of parasites of birds may irritate or bite humans and that birds may play a very important role in food contamination (Schmutter *et al.*, 1976).

Mites associated with birds have different relationships with the bird. These ranges from accidental associations with non-parasitic mites live on materials or prey on other invertebrates in the birds nest to true obligatory parasitic mites feed on body tissues of the host and can not live without the host (Hughes, 1959).

There are also mites which are regularly found on the bodies of birds, but which are nevertheless not to be considered as true parasites of the bird. These mites may not feed on the bird host but be merely attached to it or to its parasites, for sometime, to be carried to other places (Phoresy), or the mite may parasitize other true parasites of the bird (Hyperparasite) or the mite may prey on other parasitic and non-parasitic invertebrates on the bird host (Phagophily) (Zumpt, 1961).

Many of the mites associated with birds may harm their hosts by causing dermatitis and different allergic reactions, tissue damage and loss of blood; or act as potential vector of disease transmitting them to birds and other animals including man (Evans and Till, 1976).

The present investigation aims to:

1. Survey and identification of mite species occurring on some of the common domestic and wild birds different location in Kafr El-Sheikh Governorate, Egypt.
2. Study the incidence and rate of infestation of these birds with prevalent mite species in each suborder.

MATERIALS AND METHODS

Locality: Mites associated externally with some of the common domestic and wild birds were surveyed in different habitats in Kafr El-Sheikh Governorate, which occupies the northern site of Delta of Egypt. The localities were Kafr El-Sheikh, Disuq, Qallin and Biala.

Host birds: The chicken, *Gallus gallus* (Phasianidae, Galliformes), the duck, *Anas* sp. (Anatidae, Anseriformes) and the domestic pigeon, *Columba livia* (Columbidae, Columbiformes) were chosen to represent the domestic host birds. The bulbul, *Pyconotus barbatus* (Pyconotidae, Passeriformes), the common crow, *Corvus corone* (Corvidae, Passeriformes) and the crested lark, *Galerida cristata* (Aaludidae, Passeriformes) were selected to represent the wild host birds. Regular collection of host birds were made at biweekly intervals from the above mentioned regions during breeding season 2005 (March to August). Domestic birds were obtained from houses, local markets and poultry farms, while wild birds were hunted using small shooting. The birds were placed separately in closed plastic bags after being captured immediately and transferred to the laboratory for examination (Southwood, 1978). Because of the diversity of mite species encountered in the present investigation and to collect as many mite species as possible, different methods were used successively for collecting mites from each individual bird. The bird body was simply brushed over a shallow, large white dish for five minutes.

This method has been found to be good for collecting several ectoparasitic, free living and other mite species wandering among feather (Strandtmann and Wharton, 1958). The collecting method was followed by placing each bird in a separate modified Berlese funnel over a period of 24 hrs to ensure collection of the maximum number of mites wondering on the body surface before the decay of the bird sample.

The alcohol containing mites collected from each bird, was poured into a 9 cm petri-dish whose bottom was marked into a grid of squares 5 mm on a side. Counts of different species were made under a binocular dissecting microscope using different magnifications. The mite specimens were cleared and mounted and later identified according to Baker and Wharton (1952) and Krantz (1961) in the Department of Insect and Acarology, Plant Protection Research Institute, Dokki, Cairo.

Mean number of each mite species per bird and its percentages relative to the total number of all mite species collected from each host bird, were calculated. Also, the numbers of infested birds, numbers of the different mite species collected from each infested bird were counted, as well as percent infested birds and average numbers of the mite species per infested bird were calculated.

RESULTS AND DISCUSSION

1. Faunal composition of mites collected: During the present study, 18 different species of mites were collected from some domestic and wild birds. These species belong to 3 different suborder and 12 families. Out of the number 8 species belong to S.O. Astigmata and represents 5 families, while 6 and 4 species belong to each of the Mesostigmata and Prostigmata, respectively and representing four and three families in each of the two suborders respectively.

Suborder: Astigmata: Eight species of Astigmatid mites belonging to five families were recorded. These species and their families were as follow:

Fam.: Acaridae: was represented by three species. The highest percent of infestation was that of *Acarus siro*, it was collected only from the three domestic host birds with 52.3, 62.6 and 43.6 % of the total mite fauna from *Gallus gallus*, *Anas sp.* and *Columba livia*, respectively, while wild host birds were free of these species.

Tyrophagus putrescentiae was the most prevalent species in all domestic and wild hosts. It was recorded with high percentages among all hosts and ranged between 25.6 % for *Anas sp.* and 40.0 % for *Galerida cristata.* The second most prevalent species was *Caloglyphus* sp., it was collected from all hosts except *Gallus gallus* and *Anas sp.* with low percentage for *Columba livia* (12.2 %) and high for *Pyconotus barbatus*, *Corvus corone* and *Galerida cristata* (41.9, 60.0 and 38.6 %), respectively.

Fam. Glycyphagidae: was represented by one species, *Glyphagus* sp. It was collected from all hosts except crow. The higher infestation occurred with *Gallus gallus* (3.3 %) while the lower incident species was *Anas sp.* (0.8 %).

Fam. Analgidae: This family was represented by two species, *Megninia cubitalis*, it was collected from only two hosts with low infestation 1.8, 0.8 % for *Columba livia* and *Pyconotus barbatus*, respectively, while *Megninia columbae* was collected from all hosts except *Gallus gallus* with different infestation and ranged between 0.6 % to 3.7 % for *Columba livia* and *Corvus corone*, respectively.

Table (1): Plate 1: % mite species collected from domestic and wild birds at Kafr El-Sheikh Governorate, 2005 season.

Suborder Family and species	Domestic-hosts			Wild-Hosts		
	Gallus gallus	*Anas* sp.	*Columba livia*	*Pyconotus barbatus*	*Corvus corone*	*Galeridae cristata*
Astigmata	92.6	95.2	93.2	87.4	90.0	86.0
Acaridae	85.7	88.2	82.0	80.1	86.3	78.6
Acarus siro	52.3	62.6	43.6	0.0	0.0	0.0
Tyrophagus	33.4	25.6	26.2	38.2	26.3	40.0
casei	0.0	0.0	12.2	41.9	60.0	38.6
Caloglyphus sp.	3.3	0.8	2.5	1.1	0.0	1.8
Glycyphagidae	3.3	0.8	2.5	1.1	0.0	1.8
Glycyphagus sp.	0.0	3.4	2.4	2.4	3.7	2.2
Analgidae	0.0	0.0	1.8	0.8	0.0	0.0
Megninia	0.0	3.4	0.6	1.6	3.7	2.2
cubitalis	1.0	0.0	6.6	3.8	0.0	3.4
Megninia	1.0	0.0	6.6	3.8	0.0	3.4
columbae	2.6	2.8	0.0	0.0	0.0	0.0
Dermoglyptidae	2.6	2.8	0.0	0.0	0.0	0.0
Dermoglyphus						
oclumbae						
Pyroglyphidae						
Dermatophagoid						
es farinae						

Fam.: Dermoglyphidae: was also represented by one species, *Dermoglyphus columbae*. It was collected from all hosts except *Anas sp.* and *Corvus corone*. The highest infestation was for *Columba livia* (6.6 %) while the lowest one was for *Gallus gallus* (1.0 %).

Fam. Pyroglyphidae: was also represented by one species, *Dermatophagoides farinae*. It was only collected form *Gallus gallus* and *Anas sp.* with 2.6 and 2.8 % infestation, respectively.

In Israel, Mumcuoglu and Lutsky (1990) found that acarid mites were the most prevalent mites in poultry houses. Rosen *et al.* (1988) found the feather mites, *Megninia hologastra* ectoparasitize 5 of 35 chicken flocks, from 20 farms, South of Tel-Aviv, Israel, the mite were found on the counter feathers.

Suborder: Mesostigmata: Six species of Mesostigmatid mites belonging to four families were recorded. These species and their families were as follows**:**

Family: Dermanyssidae: Among Mesostigmata occurring on all domestic and wild hosts, *Dermanyssus gallinae* was the common mite species, and was found at the highest percentage on *Gallus gallus* (3.2 %), while it was found in less percentage on *Anas sp.* (0.8 %).

Table (1): Plate 2:

Suborder Family and species	Domestic-hosts			Wild-Hosts		
	Gallus gallus	*Anas* sp.	*Columba livia*	*Pyconotus barbatus*	*Corvus corone*	*Galeridae cristata*
Mesostigmata	5.4	2.2	4.1	9.6	6.6	7.1
Dermanyssidae	3.2	0.8	2.2	3.2	4.8	3.7
Dermayssus gallinae	3.2	0.8	2.2	1.4	2.6	3.1
Pellonyssus sp.	0.0	0.0	0.0	1.8	2.2	0.6
Macronyssidae	1.1	0.0	1.6	1.0	0.0	0.0
Ornithonyssus	1.1	0.0	0.9	0.0	0.0	0.0
sylviorum	0.0	0.0	0.7	1.0	0.0	0.0
Macronyssus bursa	0.8	0.5	0.3	4.6	1.8	2.8
Laelapidae	0.8	0.5	0.3	4.6	1.8	2.8
Androlaelaps sp.	0.3	0.9	0.0	0.8	0.0	0.6
Ascidae	0.3	0.9	0.0	0.8	0.0	0.6
Ascides sp.						

Pellonyssus sp. was collected only from wild hosts and were 1.8, 2.2 and 0.6 % infestation for bulbul, crow and crested lark respectively.

Family: Macronyssidae: was also represented by two species. *Onithonyssus sylviarum*, it was only collected from *Gallus gallus* and *Columba livia* with lowest infestation of 1.1 and 0.9 %, respectively, while *Macronyssus bursa*, was collected only from *Columba livia* and *Pyconotus barbatus* with low infestation also.

Family: Laelapidae: This family was represented by only one species, *Androlaelaps* sp., it was collected from all domestic and wild hosts, and recorded among all hosts and ranged between 0.3 % for *Columba livia* and 4.6 % for *Pyconotus barbatus*.

Family: Asciade: It was also represented by only one species, *Ascides* sp. as it was collected from all hosts with low infestation except *Columba livia* and *Corvus corone*.

Baker *et al.* (1976) observed that *Ornithonyssus sylviarum* the serious pest of domestic fowl and many wild birds and *Pellonyssus nidicolus* was collected from wild bird nests in New York. He also found that *Dermanyssus gallinae* is widely distributed species on domestic fowl, Turkey, duck, pigeon and sparrow. Okaeme (1988) surveyed the ectoparasites of Guinea fowl and chickens at local markets of Kontagora, Nigeria. He found *Ornithonyssus bursa, Dermanyssus gallinae* Dermanyssidae, Mesostg. and *Megninia cubitalis* Analgidae, Astigmata.

Suborer: Prostigmata: Four species belonging to three families were collected from this suborder.

Family: Cheyletidae: Two species of cheyletid mites were collected. *Cheyletus malaccensis*, it was collected from all bird hosts (domestic and wild). The highest percentage was with *Galerida cristata* (5.4 %), while the lowest one was with *Anas sp.* (1.0 %). *Ornithocheylentini* sp. was collected from *Anas sp.* only with 0.8 %.

Family: Cheyletellide: Only one species was collected, *Batericheyla chanayi*. It was collected from only three wild hosts (*Pyconotus barbatus, Corvus corone* and *Galerida cristata*) and their percent infestation was 1.4, 0.6 and 1.5 %, respectively.

Table (1): Plate 3:

Suborder Family and species	Domestic-hosts			Wild-Hosts		
	Gallus gallus	*Anas* sp.	*Columba livia*	*Pyconotus barbatus*	*Corvus corone*	*Galeridae cristata*
Prostigmata	2.0	2.6	2.4	3.0	3.4	6.9
Cheyletidae	1.6	1.8	2.0	1.6	2.8	5.4
Cheyletus malaccensis	1.6	1.0	2.0	1.6	2.8	5.4
Ornithocheylentini sp.	0.0	0.8	0.0	0.0	0.0	0.0
Cheyletellidae	0.0	0.0	0.0	1.4	0.6	1.5
Batericheyla chanayi	0.0	0.0	0.0	1.4	0.6	1.5
Tarsonemidae	0.4	0.0	0.4	0.0	0.0	0.0
Tarsonemus granaries	0.4	0.0	0.4	0.0	0.0	0.0

Family: Tarsonemidae: It was represented by one species only. *Tarsonemus granaris* which was collected only from *Gallus gallus* and *Columba livia* with low infestation (0.4 % for each), while the other hosts was free of this species. Woodroffe (1954) found that members of family Cheyletidae are especially common in bird nests and have been found to occur with their Acarid preys.

2. Incidence and rate of infestation of birds with different mites: Percent infested birds (incidence of infestation) and average number of total mite species per infested bird (rate of infestation) during the present investigation were recorded throughout months of breeding season (March-August). Data presented in Table (2), revealed that the highest percent of infestation was recorded in *Columba livia* (85.7 %) followed by *Gallus gallus* (72.4 %), while *Pyconotus barbatus* was the lowest one (26.2 %)**.**

Table (2): Incidence and rate of infestation of birds with different mites during breeding season 2005.

Host	% infested bird	Av. no. of mites individual						
		March	April	May	June	July	August	Mean
Gallus gallus	72.4	17.5	19.5	22.2	25.1	30.9	24.9	23.3
Anas sp.	65.8	12.7	15.4	18.5	19.0	24.6	20.5	18.4
Columba livia Pyconotus	85.7	24.5	32.6	38.2	43.4	47.6	38.1	37.4
barbatus	26.2	3.1	7.8	12.0	17.3	15.6	17.0	12.1
Corvus corone Galerida	38.6	8.1	10.7	17.6	16.5	22.1	25.2	16.7
cristata	56.8	14.7	17.4	20.5	21.0	26.6	22.5	20.4

Also, number of mites associated with *Gallus gallus* , *Anas sp., Columba livia* and *Galerida cristata* gradually increased among breeding season months to reach the maximum during July (30.9, 24.6, 47.6 and 26.6 mites / bird), respectively. The corresponding lowest numbers of mites for these birds were recorded in March (17.5, 12.7, 24.5 and 14.7 mites / bird).

On the other hand, the highest numbers of mites/bird for *Pyconotus barbatus* was found during June (17.3), while it was recorded its summit during August for *Corvus corone* (25.2 mites / bird). Also, the highest average number of mites was recorded in the samples collected from *Columba livia* (37.4 mites / bird) followed by *Gallus gallus* (23.3), while the lowest one from *Pyconotus barbatus* (12.1 mites / bird).

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