

Prevalence of External Parasites in Cattle Egret (*Bubulcus Ibis*) in Egypt

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Abstract:

The present study was aimed to determine the ectoparasites infested the cattle egrets (*Bubulcus ibis*) and its role in maintenance of such parasites in nature or transmission of these parasites to other species of wild and domestic birds especially after dramatic increase of cattle egret's population inside the urban areas. During this study, a total of 106 cattle egrets (*Bubulcus ibis*) were examined for the detection of external parasites of which 5 species ectoparasites; two lice, one tick larvae, one flea and one dipteran fly were detected. The detected ectoparasites were two lice species *Ciconiphilus decimfasciatus* (67.92%) and *Menopon gallinae* (45.28), one tick *Argas persicus* larvae (11.32), one fly *Pseudolynchia* sp. (9.43%) and one flea *Ctenocephalides canis* (1.88 %). Five factors (habitat, area of collection, sex, age and season) affecting the prevalence of these parasites in cattle egrets were studied.

Introduction:

Cattle Egrets (*Bubulcus ibis*) are common birds with a worldwide distribution. They forage in fields with cattle and other livestock and nest in dense colonies, often in urban areas (*Telfair, 1993*). Cattle egret shares the human habitat (*Subramanya, 1996*) and forage on wastes and garbage (*Javed, 1983*) and also feed on invertebrate and fish (*Seedikkoya, 2003*). It plays role in management of insect pests in different agro-ecosystems (*Yadav, 2000*).

Wild birds harbor many species of ectoparasites such as lice, tick, mites, fleas and other blood sucking

insects which affect directly on the general health condition of birds or indirectly transmit blood parasites to them or domestic birds (*Abd El-Wahab, 1996*). Cattle egret removes ticks and flies from cattle, but it can be implicated in the spread of tick borne animal diseases. (*McCarthy, 2006*).

The aim of this work is to study the prevalence of ectoparasites that can affect the cattle egret in two locality of Egypt, the possibility of transmission of such parasites to other species and also determine the relationship of five factors; habitat, area of collection (locality), season, age and sex of the cattle egret with

the prevalence of ectoparasites in cattle egret.

Material and Methods:

During the period extended from September 2013 to August 2014, one hundred and six cattle-egrets were hunted by net traps and divided into five groups according to: habitat (rubbish collecting areas in urban areas 24 and agriculture area 82), area of collection (Ismailia 44 and Sharkia 62), sex (male 68 and female 38), age (adult 46 and young 60) and season (Autumn 18, Winter 18, Spring 40 and Summer 30)

The investigated birds will be thoroughly and systematically examined using a piece of cotton soaked in ether from head, neck, wings and body by the naked eye and bright light with the aid of hand lens. The detected ectoparasites will be collected from different parts of the body by fine forceps.

The birds seem to be free from ectoparasites were dusted by pinch method (*Hafez and Madbouly, 1966*), with insecticide powder and left for 15 minutes then the bird ruffled five times at interval of 5 minutes over a white sheet of paper. The ectoparasites were collected by fine hair brush. The collected ectoparasites from each bird will be placed in a separate vial containing suitable media for storage, alcohol glycerol (95% ethanol and 5 % glycerol) for identification (*Hafez and Madbouly, 1966*).

Each vial will be labeled by fully data which include locality data of

collection and serial number. The collected ectoparasites were put in lactophenol for clearing and mounted in polyvol (*Baker and Warbton, 1959*).

Results and Discussion

Prevalence of ectoparasites in the examined cattle egrets:

As shown in Table (1), the overall prevalence of external parasites in the current study was (69.81%). A lower infestation rate was recorded by *Amer and El Bashier (1994)* (44.44 %), *Abd El- Wahab (1996)* (57.14 %), *Dik and Halajian (2013)* (15.2%) in wild birds of Iran and *Girisgin et al (2013)* (58.8%) in wild birds in northwestern Turkey.

In our opinion, the higher infestation rate of parasites in the current study may be related to the wide area of investigation (two governorates: Ismailia and Sharkia and two different habitats; Agriculture and Rubbish area).

Regarding to the detected ectoparasites, lice *Ciconiphilus decimfasciatus* (Fig. 1&2) was revealed from (67.92%) of the examined cattle egrets (*Bubulcus ibis*) in the present study. Both *Hafez and Madbouly (1968)* and *Marietto-Gonçalves(2012)* recorded *Ciconiphilus decimfasciatus* infested cattle egret. A lower prevalence was recorded by *Abd El- Wahab (1996)* (54.76%).

Chewing lice *Ciconiphilus decimfasciatus* is ectoparasites of birds that has adverse effect on the feather (*Dik and Halajian, 2013*). It

causes pruritus, restlessness and the birds refuse feeding (**Serra-Freire and Mello, 2006**).

In the current study, the prevalence of lice *Menopon gallinae* (Fig. 4&5) was (45.28%) from the examined cattle egret. A lower prevalence was recorded by **Amer and El Bashier (1994)** (4.16%) and **Abd El- Wahab (1996)** (38.9%) while a higher prevalence was recorded by **Khattak et al (2012)** (63.63%) in other birds.

Menopon gallinae is chewing or biting lice of poultry that effect on the vitality and productivity of birds. Such lice play an important role in transmission of fowl cholera, typhoid and toxoplasmosis (**Saxena et al, 1985**). **Ruff (1999)** stated that these lice retard the growth, lowered the vital activity and damage the health condition of the host.

The higher prevalence of lice in the current study may returned to the intensive population of cattle egrets, as the cattle egret was a gregarious bird make large colonies with other wading birds (**del Hoyo et al, 1992**). In our opinion, the mixed colonies of cattle egret may make it a source of ectoparasites infestation to other wild birds and also for the backyard domestic birds.

Tick *Argas persicus* larvae (Fig, 5), was revealed with a prevalence (11.32%). This result was in agreement with the result recorded by **Abd El-Wahab (1996)** (11.90%). **Kaiser et al (1964)**; **Kaiser and Hoogstraal (1969)** and **Guirgis**

(1971) also recorded the infestation of cattle egret with *Argas persicus* larvae. A higher prevalence was recorded by **Qamar et al (2009)** (56.71%) in the rural poultry at Lodhran, Pakistan.

Tick (*Argas persicus*) was a major external parasite responsible for low productivity in rural poultry (**Qamar et al, 2009**) and transmitted *Borrelia anserina* which is the causative agent of fowl Spirochaetosis (**Telmadarraiy et al, 2007**).

From our opinion, the intensive population of cattle egret and the large mixed colonies over the trees may help in the spreading of *Argas persicus* infestation. Also the dispersal of cattle egret inside the urban areas making it a potential hazard to the backyard domestic birds.

In the current study, *Pseudolynchia* sp. fly was recovered from (9.43%) of the examined cattle egrets (*Bubulcus ibis*). **Gredilha et al (2008)** recorded *Pseudolynchia canariensis* out of its natural host (*Columba livia*).

In our opinion, presence of *Pseudolynchia* sp. in cattle egret may give indication about the role of cattle egret in the preservation of such fly in the nature and may be aid in its propagation and transmission to pigeons.

Regarding to flea *Ctenocephalides canis* (Fig 6&7), it was recorded in two birds only (1.88%) from a total of 106 cattle egrets in the current study. *Ctenocephalides canis* (dog

flea) was a species of flea that lives as an ectoparasite on a wide variety of mammals, particularly the domestic dog and cat. It fed on their blood; sometimes bite humans and was generally more prevalent worldwide (*Linardi and Santos, 2012*).

In our opinion, presence *Ctenocephalides canis* in cattle egret may be accidental as it recorded in two birds only but also may be an evidence for the role of cattle egret (*Bubulcus ibis*) in transmission of such flea to stray dogs and cats.

In the present study, five factors (habitat, area of collection, sex, age and season) affecting the prevalence of these parasites in cattle egrets were studied.

Concerning the habitat as shown in Table (2), the general infestation of ectoparasites showed a significant difference in the agriculture habitat and the prevalence of the lice (*Ciconiphilus decimfasciatus* 75.6% and *menopon gallinae* 53.65%) infestation showed a higher significance difference in the agriculture habitat ($P \leq 0.01$) and may be attributed to that the nests of cattle egrets were above the trees in large colonies around bodies of water (*Telfair, 2006*) in the agriculture areas, these intensive population of birds lead to a higher infestation with external parasites.

Regarding the area of collection (locality) as shown in Table (3), both the general infestation (93.54%) and the infestation with

lice *Ciconiphilus decimfasciatus* (93.54%), *Menopon gallinae* (70.96%) and tick *Argas persicus* larva (19.35) showed a higher significant difference ($P \leq 0.01$) in Sharkia due to the agriculture nature of the province with the increase of the colonies formation and the perfect habitat for breeding which make the population of cattle egrets is intensive with a higher infestation with ectoparasites. While *Pseudolynchia* sp. (22.72%) fly showed a higher significant difference ($P \leq 0.01$) in Ismailia due to the increases in the rubbish and flies in the area of cattle egret aggregation.

Concerning to the sex as shown in Table (4), male cattle egrets showed a higher significant difference in general to the infestation ($P \leq 0.01$) of ectoparasites (79.41%) and in the infestation of lice (*Ciconiphilus decimfasciatus* 79.41%, *Menopon gallinae* 58.82%) and that may return to the number of the collected samples, where the number of trapped males cattle egrets were nearly double the number of females samples.

Regarding to age as shown in Table (5), a higher significant difference between the young and adult ($P \leq 0.01$) was recorded where the general infestation (96.66%) and the infestation with *Ciconiphilus decimfasciatus* (96.66%), *Menopon gallinae* (73.33%), tick *Argas persicus* larvae (20%) appeared higher in the young age and that may explained as the cattle egret

give 3-5 eggs and the incubation period lasts around 23 days, with both sexes sharing incubation duties and young birds stay in the nest for 45 till they become independent (*Kushlan and Hancock, 2005*) and the both sex rearing the young (*Telfair, 2006*) so high number of birds per nest (parents and 3 young at least) for long period (about 45 days) with the little movement of young in small nest may increase the infestation of young with external parasites. Also the immunity may play a role as reported by *Qamar et al (2009)* who recorded that the prevalence of Anti-*Argas persicus* antibodies was higher in adult poultry birds (19.5%) than in young one (9.08%) so the young has more tendency for infestation.

While *Pseudolynchia* sp. (21.73%) showed a higher significant difference in the adult ($P \leq 0.01$) and that may explained on our opinion as most of the infested adult cattle egrets with *Pseudolynchia* sp. were trapped from the rubbish collecting area.

Concerning to seasons as shown in Table (6), the general prevalence of infestation with ectoparasites in cattle egret was (Autumn 55.55%, Winter 33.33%, Spring 95% and

Summer 66.66%). A lower prevalence was recorded by *Abd El-Wahab (1996)* (Autumn 23.25, Winter 40.98%, Spring 50% and Summer 39.53%).

In the current study, a higher significant difference ($P \leq 0.01$) in the general infestation of ectoparasites (95%) and in the infestation of lice *Ciconiphilus decimfasciatus* (95%) and *Menopon gallinae* (65%) and a significant difference ($P \leq 0.05$) was showed in tick *Argas persicus* larvae (30%) in the Spring and that may explained as the Spring and early Summer consider the breeding seasons of cattle egret (from March to October) (*Skerrett et al, 2001*) so increase the contact between birds during the breeding season and building the nest in large colonies, increase the possibility of the infestation with external parasites.

Conclusion:

Although the cattle egret has many benefits as a biological control for insects, agriculture and animals pests, the caution must be considered when dealing with it especially after the dramatic increase of its numbers in urban areas as it may transmit many ectoparasites to other wild and domestic birds.

Table (1): Prevalence of different species of ectoparasites in cattle egrets.

Ectoparasite species	No. Of infested / No. of examined	Prevalence %
Total ectoparasites	74/106	69.81
<i>Ciconiphilus decimfasciatus</i>	72/106	67.92
<i>Menopon gallinae</i>	48/106	45.28
<i>Argas persicus</i> larvae	12/106	11.32
<i>Pseudolynchia</i> sp.	10/106	9.43
<i>Ctenocephalides canis</i>	2/106	1.88

Table (2):The prevalence of different ectoparasites in cattle egrets in relation to the habitat:

Ectoparasites	Habitat	No. of infested/ No. of examined	Prevalence%	X ²	P value
Ectoparasites	Rubbish	12/24	50	4.626	0.031*
	Agriculture	62/82	75.6		
<i>Ciconiphilus decimfasciatus</i>	Rubbish	10/24	41.66	8.32	0.003**
	Agriculture	62/82	75.6		
<i>menopon gallinae</i>	Rubbish	4/24	16.66	8.81	0.003**
	Agriculture	44/82	53.65		
<i>Argas persicus</i> larvae	Rubbish	0/24	0	2.63	0.104
	Agriculture	12/82	14.63		
<i>Pseudolynchia</i> sp.	Rubbish	6/24	25	6.6	0.102
	Agriculture	4/82	4.87		
<i>Ctenocephalides canis</i>	Rubbish	0/24	0	0.006	0.93
	Agriculture	2/82	2.43		

*(Significant difference $P \leq 0.05$) ** (highly significant $P \leq 0.01$)

Table (3): The prevalence of different ectoparasites in cattle egrets in relation to the area of collection.

Ectoparasites	Area of collection	No. of infested/ No. of examined	Prevalence%	X ²	P value
EctoParasites	Ismailia	16/44	36.36	37.26	0.0001*
	Sharkia	58/62	93.54		
<i>Ciconiphilus decimfasciatus</i>	Ismailia	14/44	31.81	42.22	0.0001*
	Sharkia	58/62	93.54		
<i>menopon gallinae</i>	Ismailia	4/44	9.09	37.31	0.0001*
	Sharkia	44/62	70.96		

<i>Argas persicus</i> larvae	Ismailia	0/44	0	7.77	0.005**
	Sharkia	12/62	19.35		
<i>Pseudolynchia</i> sp.	Ismailia	10/44	22.72	13.01	0.0003*
	Sharkia	0/62	0		
<i>Ctenocephalides canis</i>	Ismailia	2/44	4.54	0.94	0.33
	Sharkia	0/62	0		

*(Significant difference $P \leq 0.05$) ** (highly significant $P \leq 0.01$)

Table (4): The prevalence of different ectoparasites in cattle egrets in relation to the sex of cattle egrets:

Ectoparasites	Sex	No. of infested/ No. of examined	Prevalence %	X ²	P value
EctoParasites	Male	54/68	79.41	7.07	0.007**
	Female	20/38	52.63		
<i>Ciconiphilus decimfasciatus</i>	Male	54/68	79.41	10.06	0.001**
	Female	18/38	47.36		
<i>Menopon gallinae</i>	Male	40/68	58.82	12.5	0.0004**
	Female	8/38	21.05		
<i>Argas persicus</i> larvae	Male	10/68	14.7	1.32	0.24
	Female	2/ 38	5.26		
<i>Pseudolynchia</i> sp.	Male	4/68	5.88	1.76	0.18
	Female	6/38	15.78		
<i>Ctenocephalides canis</i>	Male	0/68	0	1.35	0.24
	Female	2/38	5.26		

*(Significant difference $P \leq 0.05$) ** (highly significant $P \leq 0.01$)

Table (5): The prevalence of different ectoparasites in cattle egrets in relation to the age of cattle egrets.

Ectoparasites	Age	No. of infested/ No. of examined	Prevalence %	X ²	P value
EctoParasites	Adult	16/46	34.76	44.4	0.0001**
	Young	58/60	96.66		
<i>Ciconiphilus decimfasciatus</i>	Adult	14/46	30.43	49.2	0.0001**
	Young	58/ 60	96.66		
<i>Menopon gallinae</i>	Adult	4/46	8.69	41.32	0.0001**
	Young	44/60	73.33		
<i>Argas persicus</i> larvae	Adult	0/46	0	8.47	0.0036**
	Young	12/60	20		
<i>Pseudolynchia</i> sp.	Adult	10/46	21.73	11.97	0.0005**
	Young	0/60	0		
<i>Ctenocephalides canis</i>	Adult	2/46	4.34	0.82	0.36
	Young	0/60	0		

*(Significant difference $P \leq 0.05$) ** (highly significant $P \leq 0.01$)

Table (6): The prevalence of different ectoparasites in cattle egrets relation to the season.

Ectoparasites	Season	No. of infested/ No. of examined	Prevalence %	X ²	P value
Ectoparasites	Autumn	10/18	55.55	25.28	0.0001**
	Winter	6/18	33.33		
	Spring	38/40	95		
	Summer	20/30	66.66		
<i>Ciconiphilus decimfasciatus</i>	Autumn	10/18	55.55	32	0.0001**
	Winter	4/18	22.22		
	Spring	38/40	95		
	Summer	20/30	66.66		
<i>Menopon gallinae</i>	Autumn	0/18	0	27.65	0.0001**
	Winter	4/18	22.22		
	Spring	26/40	65		
	Summer	18/30	60		
<i>Argas persicus larvae</i>	Autumn	0/18	0	22.32	0.0001**
	Winter	0/18	0		
	Spring	12/40	30		
	Summer	0/30	0		
<i>Pseudolynchia sp.</i>	Autumn	8/18	44.44	33.17	0.0001**
	Winter	2/18	11.11		
	Spring	0/40	0		
	Summer	0/30	0		
<i>Ctenocephalides canis</i>	Autumn	2/18	11.11	9.96	0.018*
	Winter	0/18	0		
	Spring	0/40	0		
	Summer	0/30	0		

*(Significant difference $P \leq 0.05$) ** (highly significant $P \leq 0.01$)

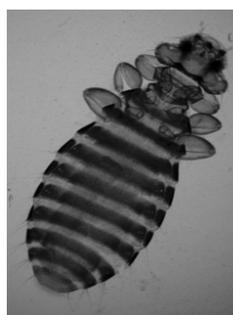


Fig. (1): *Ciconiphilus
decimfasciatus* (Male)

Fig. (2): *Ciconiphilus
decimfasciatus* (Female)

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الملخص العربي**مدى تواجد الطفيليات الخارجية في طائر أبو قردان في مصر**

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تهدف هذه الدراسة إلى تحديد الإصابة بالطفيليات الخارجية في طائر أبو قردان والدور الذي يلعبه في استمرارية هذه الطفيليات في الطبيعة أو نقلها إلى الأنواع الأخرى من الطيور البرية و المستأنسة في محافظتي الأسماعيلية والشرقية خاصة بعد الزيادة الملحوظة في أعداد أبو قردان داخل المناطق الحضرية.

خلال هذه الدراسة ، تم فحص عدد ١٠٦ من طائر أبو قردان وتم تصنيف عدد خمسة أنواع من الطفيليات الخارجية، نوعين من القمل العارض، ونوع من يرقات القراد اللين ، ونوع من البراغيث و نوع من الذباب الطائر.

وكانت الطفيليات الخارجية التي تم العثور عليها هي نوعين من القمل العارض سيكونيفليس ديسمفاشيتس (٦٧,٩٢٪) و مينوبون جاليني (٤٥,٢٨٪)، يرقة نوع من القراد اللين أرجس بريسكس (١١,٣٢٪)، نوع من الذباب الطائر سيدولينكيا (٩,٤٣٪) و نوع من البراغيث (برغوث الكلب) كتينوسيفاليدس كانز (١,٨٨٪). وقد تم دراسة تأثير خمسة عوامل (المأوى ،مكان التجميع، الجنس، العمر وفصول السنة) على مدى تواجد هذه الطفيليات الخارجية على طائر أبو قردان.