

ECOLOGICAL STUDIES ON CATTLE EGRET BIRD *Bubulcus ibis* AND ITS ASSOCIATED ECTO AND ENDO-PARASITES AT BENI SUEF GOVERNORATE, EGYPT

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ABSTRACT

Some ecological studies on cattle egret bird in addition to survey of ecto and endo-parasites associated with it were conducted in two different locations at Beni Suef Governorate. Results showed that birds numbers in the field crops were more at sunrise than sunset all over year months, while vice versa occurred in fruit orchards. The highest number of bird was observed in spring and summer seasons, but the lowest number was in autumn and winter. Cattle egret birds damaged flowers and fruits of citrus with 15.0 and 7.0%, respectively. Regarding associated ectoparasites, two insect species; *Sarcophaga sp.* and *Demests maculatus* were found in the bird nests, while lice species *Lipeurus sp.* and *Tinnoton anserinum* were recorded on the young and adult birds with different numbers. Also, two soft ticks species i.e *Argas persicus*, *Argas reflexus* and one species of mite *Spinibdella bifurcate* were found in nests, nestling and adult birds. Another two mites species *Acarus sp.* and *Caloglyphus sp.* were only recorded on the young and adult individuals. Inspection of endoparasites revealed that *Coccidia* oocysts, *Ascaridia* ova and *Pseudomonas*, *Proteus*, enteric bacteria and yeast were isolated from alive adult, young birds intestine and their dropping while blood samples were negative for blood parasites.

INTRODUCTION

The role of cattle egret as beneficial bird is doubtful. However, some agricultural laws set to protect this bird species as possible as we can. It is understandable that this bird is beneficial to cattle, as it walks among grazing cattle and sits on their backs to catch the harmful insects and other small animals, it even follows ploughs running in land preparation to pick larvae and pupa of insects in addition to small animals particularly snails and slugs. It is also considered a noxious when feeds on beneficial insects which play an important role in biological control in the field in addition to losses in fruit orchards when it breeds and nest on the trees (El - Deeb *et al* 2001).

Recently, there were an increasing awareness of the role of ectoparasites associated with vertebral animals as vectors of diseases and producers of dermatitis in man and domestic animals. The aim of the present study is to survey the ecto and endoparasites associated with cattle egret birds and their nests and as well as damage caused by nesting birds to citrus orchard trees.

MATERIALS AND METHODS

1- Population dynamics:-

Population dynamics and daily activity of cattle egret *Bubulcus ibis* were monthly conducted during two successive years 2002 and 2003 to find

out the relationship between the bird activity and different cultural operations in two different ecosystems, fields and citrus orchards (each of 50 feddans) at El-Wasta district, Beni Suef Governorate. Bird activity was accessed by counting the individuals twice a day; at sunrise and sunset. Each count lasted an hour for 4 successive days. The population counts of cattle egret birds were conducted according to Reidinger and Libay (1979) using binocular field glass. Bird numbers of each location were recorded and average number of birds per feddan was calculated.

1- Determination of damage to fruit orchards :-

Citrus orchard trees (about 50 feddans) were selected at El-Wasta district, Beni Suef Governorate to determined the dropped flowers and fruits caused by nesting of cattle egret birds in the trees. Ten infested trees and another uninfested ones (as a control) were randomly chosen in the beginning of flowering stage. Dropping fruits were counted weekly until the harvest and their percentage were calculated in both infested and uninfested trees to estimate the actual damage resulting by infestation of cattle egret birds.

2- Ecto and endo parasites associated with cattle egret:-

The cattle egret birds and their nests with harbored nestlings were collected from fruit orchards and individually put into plastic bags and transferred to laboratory. Ectoparasites were collected from nests, nestling and adult birds individually using a brush and Barrels funnel technique. The collected ectoparasites were counted and temporarily preserved in separate labeled vials containing 70% ethanol. Ectoparasites were mounted and later identified. The adult and nestling alive birds (10 animals of each) and their fresh dropping samples were sent to Animal Health Research Institute, Agric. Res. Center to be investigated for microorganisms and different endoparasites examination.

RESULTS AND DISCUSSION

1- Population dynamics:-

The obtained results in Table (1) revealed that birds number when counted during sunrise period overcome those recorded through sunset period during the most of year months in fields, while the contrast was observed in fruit orchards (citrus trees). This phenomenon may be due to the attention of birds to use trees for overnight. Total number of birds at sunrise and sunset were 307.4 and 253.7 birds / feddan for field crops with mean numbers 280.9 birds / feddan while they were 190.5 and 240.6 for sunrise and sunset in citrus orchards with mean numbers 215.7 bird / feddan. The population dynamics was noticeably fluctuated from one month to another and strongly correlated with the cultural operations. Average number of birds started to increase during the period prior to land cultivation in which plough and land preparation are run as insects and other small animals become more available. These number increased from 12.8 birds / feddan during December in which insects and other prey are rare to 23.5, 33.8 and 31.6 birds / fed., during January, February and March, respectively. Moderate

numbers were recorded during the harvest of winter crops and before planting summer crops to be 28.9 and 29.8 birds in May and June, respectively.

Regarding the activity and relative abundance of cattle egret in fruit orchards, bird density was abundant during spring and summer seasons as the prey were available. The bird numbers were 23.2, 25.7, 25.6 and 20.7 birds / fed., In April, May, June and July, respectively. Wilson (2002) observed similar results at Kafr El-Sheikh Governorate. Also, our results are agree with Khattab (1998) who observed that the highest activity of cattle egret was in spring and summer seasons while the lowest was in autumn and winter because the insect population was low. Walts and Bradshaw (1994) Indicated that colony sites of egrets were situated farther from man-made structures and in areas where the density of structured was lower when compared with randomly located sites on the coastal plain. Farinha and Leito (1996) mentioned that cattle egret distribution was influenced by area of dry pasture and presence of fresh water and weather variables.

Table(1) : Population dynamics of cattle egret bird in two different locations at Beni Suef Governorate during two successive years(2002 -2003) .

Month	Average No. of birds / Feddan					
	Field crops			Fruit orchards		
	Sunrise	Sunset	Mean	Sunrise	Sunset	Mean
January	26.7	20.3	23.5	10.9	13.7	12.3
February	37.5	30.1	33.8	12.4	20.2	16.3
March	36.7	26.4	31.6	14.2	17.4	15.8
April	25.0	20.2	22.6	22.6	23.8	23.2
May	26.0	31.7	28.9	23.1	28.2	25.7
June	32.7	26.8	29.8	24.5	26.7	25.6
July	23.5	19.4	21.5	19.3	22.0	20.7
August	16.0	12.0	14.0	14.7	18.7	16.7
September	14.8	14.7	14.8	13.8	18.5	16.2
October	26.2	16.7	21.5	11.5	18.3	14.9
November	29.1	23.0	26.1	13.2	17.0	15.1
December	13.2	12.4	12.8	10.3	16.1	13.2
Total	307.4	253.7	280.9	190.5	240.6	215.7

2- Damage to fruit orchards :-

The damage to flowers and fruits of citrus trees caused by cattle egret birds was estimated and recorded in table (2). The obtained results indicate that nesting birds dropped 25.3% of citrus flowers during April comparing with 10.3% only in uninfested trees with 15.0% damage percentage. The damage to fruits due to cattle egret birds started from the beginning of budding in May whereas the dropping fruits were 3.3% and gradually increased to reach the maximum when they matured during October and November with damage percentages 5.9 and 7.0%, respectively. El- Deeb *et al* (2001) found that damage by cattle egret to flowers and fruits of orange at Kafr-El-Sheikh Governorate were 12.2 and 6.7%, respectively. Kramer (1975) indicated that droppings of many herons kill plants near the nest trees and may also damage the trees themselves.

3-Ectoparasites :-

Data in Table (2) represent the different species of ectoparasites (insects, ticks and mites) associated with nests, young and adult of cattle egret birds. Data revealed that there were four different insect species and five different Acari species (2 soft ticks and 3 mites species) Regarding the insect species, flesh fly *Sarcophaga sp.* and chees & skin beetle *Dermests maculatus* were the only insect species exist in the cattle egret nests. The mean number of each species was 13.9 insect / nest for *Sarcophaga sp.* while it was only 5.6 insect / nest for *Dermests maculates*. On the young birds (nestlings), two different species of lice were recorded i.e. *Lipeurus sp.* (*Columbicola columbae*) and *Trinoton anserinum* with average numbers of 12.0 and 16.7 insect / young bird for each species, respectively. Also the same two insect species were recorded on the adult birds with mean number of 10 and 12 insect / bird, respectively. The mean number of the two species were higher on the young's than adult birds. The mean number of *Trinoton anserinum* was more than *Lipeurus sp.*, in case of young or adult individuals. The total number of the different insect parasites species was highest 28.7 for young birds than adults 22.0 while the lowest number was 19.5 for nests.

Table (2): Damage of citrus trees caused by nesting of cattle egret birds at Beni Suf Governorate.

Month	Dropped parts	%dropping		% damage
		Un nested trees	Nested trees	
April	Flowers	10.3	25.3	15.0
May	Fruits	2.1	5.4	3.3
June		2.5	6.1	3.6
July		2.1	7.4	5.3
August		2.8	7.9	5.1
September		3.1	8.2	5.1
October		4.4	10.3	5.9
November		5.2	12.2	7
December		6.3	11.0	4.7

Concerning ticks and mites associated with Cattle egret birds and their nests, two species of soft tick, *Argas persicus*, *A. reflexus* and one species of mites, *Spinibdella bifurcate* were recorded in nests, young and adult birds with different numbers, while another two species of mites *Acarus sp.* and *Caloglyphus sp.* were recorded on the young and adult birds only and completely absent in bird nests.

Soft ticks *Argas persicus* was the highest number in the three cases with average no. of 37.4, 15.4 and 12.1 / individual for nests, nestling and adult birds, respectively with total number 64.9 followed by *Argas reflexus* 21.3, 9.4 and 3.7 with total number 34.4 and mite *Spinibdella bifurcate* 13.5, 4.8 and 2.2, respectively with total number of 20.5 / individual. Mites species *Acarus sp.* and *Caloglyphus sp.* were found with moderate number 7.3 & 6.7 on the young birds and 5.1 & 6.8 on the adults, for each species, respectively. The highest numbers of Acari parasites was recorded in nests 72.2 followed by nestlings (young's) 43.6 and the lowest number was 29.9

per individual. Generally, the number of Acari ectoparasites species (ticks and mites) were more than insect ectoparasites species in the all cases (nests, nestlings and adults), whereas the total numbers were 145.7 and 70.2 for Acari and insect species, respectively. Similar results were recorded by Soliman (1999) and Abdalla (1993). Fain and Philips (1977) recorded 4 species of mites, *Dermacarus pilitarsus*, *Neoxenoryctes reticulatus*, *Euglycyphagus intercatatus* and *Echimyopus orphanus* attacks snoway egret, *Egretta thula*. Also, Fain and Lee-Goff (1980) recorded *Ophthalmognathus temorioae* parasiting black-crown night heron, *Nycticorax nycticorax*. Thus, birds and their nests represent continuous sources and reservoirs of different ectoparasites to human and his animals, houses and the stored products. Schmutter *et al.* (1976) mentioned that most birds are infested with insects and these frequently migrate from birds or their nests into building e.g bedbugs, bat bugs and fleas. Birds are associated with ectoparasites which may harm their hosts causing dermatitis and different allergic reaction, tissue damage and loss of blood or acts as potential vectors transmitting diseases to birds and other animals including human (Evans and Till, 1996).

4- Endoparasites :-

Data in Table (3) cleared that there were 6 different species of endoparasites were isolated from samples of adult, young birds and their dropping, while the blood samples were negative for blood parasites. The isolated endoparasites were: ova of roundworms *Ascaridia* (*Ascaridia galli*) that was found in adult birds intestine and their feces but not for young birds, the protozoa *Coccidia* oocysts (*Eimeria sp.*), *Pseudomonas* enteric bacteria (*Pseudomonas aeruginosa*), enteric *Proteus* bacteria (*Proteus vulgaris*), colon bacteria (*Escherichia coli*) and yeast (*Cryptococcus neoformans*) were found in adult, young birds and their dropping. The internal parasitic nematodes or roundworms *Ascaridia* causes helminthiasis in poultry and *Pseudomonas* bacteria causes pseudomonas infection that may affect any part of the body while *Proteus* bacteria causes urinary tract infections.

Table (3) :Ectoparasites associated with cattle egret bird *Bubulcus ibis*

Ectoparasite type	English name	Scientific name	Average No. of ectoparasites / individual			
			Nest	Nestling	Adult	Total
Insects	Flesh Fly	<i>Sarcophaga sp.</i>	13.9	0.0	0.0	13.9
	Dove lice	<i>Lipeurus sp.</i>	0.0	12.0	10.0	22.0
	lice	<i>Trinoton anserinum</i>	0.0	16.7	12.0	28.7
	Chees & skin beetle	<i>Dermests maculatus</i>	5.6	0.0	0.0	5.6
Total			19.5	28.7	22.0	70.2
Acari	Soft ticks	<i>Argas persicus</i>	37.4	15.4	12.1	64.9
	Soft ticks	<i>Argas reflexus</i>	21.3	9.4	3.7	34.4
	Mites	<i>Spinibdella bifurcate</i>	13.5	4.8	2.2	20.5
	Mites	<i>Acarus sp.</i>	0.0	7.3	5.1	12.4
	Mites	<i>Caloglyphus sp.</i>	0.0	6.7	6.8	13.5
Total			72.2	43.6	29.9	145.7

Methling and Kersten (1994) found that bedding was the main source of worm infections, including *Ascaridia galli* in hens allowed to move freely in

voletage housing emphasizing the importance of renewing bedding between each batch of birds. It infest the small intestine and can cause ill-thrift and intestinal compaction (enteritis). Droopiness, emaciation and diarrhea are common clinical symptoms. Heavy infestations can cause death within 12 days of infection. Permin *et al* (1999) showed that *Ascaridia galli* were found in 63.8 % of organic / free range birds, 42% of deep – littered birds and in only 5 % of battery hens. The Coccidia mostly infect vertebrates and have intracellular gamonts (Duszynski and Upton , 2001). Pseudomonas bacteria grows in soil, marshes and coastal marine habitat as well as on plant and animals tissues. *Proteus vulgaris* cause infant diarrhea and cause approximately 29 % of all urinary tract infections (Hallett *et al* , 1976) and (Lanyi, 1956).

Table (4) : Endoparasites associated with cattle egret bird *Bubulcus ibis*

Endoparasit	Scientific name	Adults	Nestlings	Dropping	Blood
Ascaridia	<i>Ascaridia galli</i>	+	-	+	-
Coccidia Oocysts	<i>Eimeria spp.</i>	+	+	+	-
Pseudomonas bacteria	<i>Pseudomonas aeruginosa</i>	+	+	+	-
Proteus bacteria	<i>Proteus vulgaris</i>	+	+	+	-
Colon bacteria	<i>Escherichia coli</i>	+	+	+	-
Yeast	<i>Cryptococcus neoformans</i>	+	+	+	-

+ Positive

- Negative

REFERENCES

- Abdallah, A.A. (1993). Studies on mites associated with birds. M.Sc. Thesis, Fac. Agric., Al-Azhar Univ.
- Duszynski , D.W. and Upton , S.J.(2001). Enteric protozoans : *Cyclospora*, *Eimeria*, *Isospora* and *Cryptosporidium* (Cryptosporidiidae) spp. Chapter 16, pp. 416 – 459 , In Parasitic Diseases of Wild Mammals, 2nd ed. (W.M. Samuel, M.J. Pybus, A.A. Kocan , eds.) Iowa State University Press, Ames, IA.
- El-Deeb, H.I., Wilson, M.B. and Soliman, A.M. (2001). Beneficial and noxious sides of cattle egret, in different habitats at Kafr El-Sheikh Governorate, Egypt. J.Appl. Sci., 16, 9.
- Evans, G.O. and Till, W.M. (1996). Studies on the British dermanyssidae. Part II classification Bull. Brit. Mus. (Nat. Hist.) Zool. 14,5, 109-370.
- Fain, A. and lee-Goff, M. (1980). Spelogathine mites from birds in the Hawaiian Islands, with description of a new species. J. Med. Entomol., 17,6, 506-508.
- Fain, A. and Philips, J.R. (1977). Astigmatid mites from nests of birds in U.S.A. Description of new species of Glycyphagidae. Int. J. Aar.,3,2,105-114.

- Farinha, J.C. and Leitao, D. (1996). The size of heron colonies in Portugal in relation to foraging habitat. *Colonial Water Birds*, 19,108-114.
- Hallett, R.J., Pead, L. and Maskell, R. (1976). Urinary infections in boys. A three – year prospective study. *Lancet*. ii : 1107 – 1110.
- Khattab, M.M. (1998). Ecological studies on some wild bird species at Sharkia Governorate. Ph. D. Thesis. Fac. Agric., Al-Azhar University.
- Kramer, H. (1975). The heron. In: Grizmek's Animals life Encyclopedia Bird I (Van Nostrand Reinhold Company Inc.), 7, 189-213.
- Lanyi, B. (1956). Serological typing of Proteus strains from infantile enteritis and other sources. *Acta Microbial. Acad. Sci. Hung.* 3 : 417 – 428.
- Methling, W.H. and Kersten, K.A. (1994). Development of infectious pressure by intestinal parasites in alternative voletage housing system for laying hens. Proceedings of the 8th International Congress on Animal Hygiene, St. Paul, Minnesota, USA, 12 – 16 September 1994. International Society for Animal Hygiene, 1994. AH1 – AH5 . 4 ref.
- Permin, A.B., Frandsen, M., Pearman, F., Kold, M. and Nansen, P. (1999). Prevalence of gastrointestinal helminthes in different poultry production systems. *British Poultry Science*. 1999. 40: 4, 439 – 443. 25 ref.
- Reidinger, R.E. and Libay, J.L. (1979). Perches coated with glue reduce bird damage in rice field plots. Proceeding Eighth bird control, Seminar Bowling Green, Ohio, Nov., 201-202.
- Soliman, A.M. (1999). Eco-biological studies on some wild bird species at Kafr-El-Sheikh Governorate with specials reference to some arthropods. Ph. D. Thesis. Fac. Agric., Zagazig University.
- Schmutter, H., Evans, D.E. and Hassan, H.M. (1976). Birds and other vertebrates. Chapter 16, 223-230.
- Walts, B.D. and Bradshaw, D.S. (1994). The influence of human disturbance on the location of great blue heron colonies in the lower Chesapeake Bay, U.S.A. *Colonial Water Birds*. 17,2, 184-186.
- Wilson, M.B. (2002). Ecological and biological studies on Cattle egret under different habitats in Kafr El-Sheikh Governorate, Egypt. 2nd International Conference, Plant Prot. Res. Inst., Cairo, Egypt, 2002.

دراسات إيكولوجية على طائر أبي قردان و الطفيليات الخارجية والداخلية المصاحبة له بمحافظة بنى سويف- مصر

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تم دراسة ديناميكية التعداد لطائر أبي قردان في حقول المحاصيل الزراعية وبساتين الفاكهة بمحافظة بنى سويف ، كما تم دراسة الطفيليات الخارجية والداخلية المصاحبة لأعشاش هذا الطائر وصغاره وأفراده البالغة . وأظهرت النتائج أن أعداد هذا الطائر في حقول المحاصيل الزراعية وقت الشروق اعلي منها وقت الغروب علي مدار العام ، بينما حدث العكس في حالة أشجار الفاكهة . وقد سجل اعلي تعداد للطائر في موسمي الربيع والصيف بينما كان اقل تعداد في شهور الخريف والشتاء . وكانت نسبة الخسائر التي سببها الطائر لأشجار الموالح ١٥% للأزهرلر ، ٧% للثمار .

وبالنسبة للطفيليات الخارجية المصاحبة لهذا الطائر تم حصر نوعين من الحشرات هما ذبابة اللحم *Sarcophaga sp.* وخنفساء الجبن والجسود *Dermestes maculatus* في أعشاش الطائر وأيضا نوعين من القمل هما *Trinoton anserinum* , *Lipeurus sp.* تم رصد هما علي الصغار والأفراد البالغة للطائر بأعداد مختلفة .

كما تم رصد نوعين من القراد اللين هما *Argas reflexus*, *Argas persicus* ونوع واحد من الحلم *Spinibdella bifurcate* حيث وجدوا في أعشاش الطائر وكذلك علي الأفراد البالغة والصغيرة بينما وجد نوعين آخرين من الحلم هما *Acarus sp.* , *aloglyphus sp.* علي الأفراد الصغيرة والبالغة فقط للطائر .

أما بالنسبة للطفيليات الداخلية أظهرت نتائج الفحص وجود إصابة بديدان الاسكاريديا وطفيل الكوكسيديا المعوية كما تم عزل ميكروب السيدوموناس وميكروب البروتيويس وخمائر وذلك من أمعاء الأفراد الحية الصغيرة والبالغة وكذلك براز (زرق) للطيور بينما كانت عينات الدم سلبية لطفيليات الدم .