FOOD, FOOD REQUIREMENT DURING GROWTH, AND FEEDING BEHAVIOUR OF NESTLING BUBULCUS IBIS COROMANDUS (BODDAERT)

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THE present paper deals with food, food requirement during growth, and feeding behaviour of nestlings of *Bubulcus ibis coromandus* (Boddaert), the Cattle Egret.

MATERIAL AND METHODS

For studying the food, nineteen vomitted samples were collected from nestlings of the age group 2-30 days. The nestlings of this species vomitted when alarmed by predators or human beings. The older nestlings (15-30 days) readily vomitted but neck of younger nestlings (1-15 days) was massaged in order to provoke them to vomit. One nestling was hand-reared to study food requirement during growth. Before feeding it, food was weighed and nestling was also weighed daily to study the weight increase. Field observations were made at Bharonjian heronry (About 7 km. from Chandigarh on Chandigarh Siswan Road) comprising 132 nests.

OBSERVATIONS AND DISCUSSION

(i) Food : The analysis of food is given in Tables-1 and 2.

The food of nestlings consisted of annelids, insects, arachnids, amphibians and reptiles. The grasshoppers dominated the diet and out of them most consistent item was *Chrotogonus* sp., found in 63% of total samples.

Various authors have described the food of nestling Cattle Egrets as comprising of snails, insects, arachnids, frogs and even aves (Middlemiss, 1955; Siegfried, 1966. Skead, 1966; Jenni, 1969,. Skead (1966) stated that grasshoppers dominate the diet of nestling egrets. Jenni (1973) compared the food of nestling egrets from four different heronries and found orthopteran insects and amphibians as main components.

(ii) Food Size : In the nestling studied length of food items was found to vary from 4 mm. (spider) to 150 mm (Lizard). Siegfried (1972) stated that average size of food items eaten by nestlings increased with the age of

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TABLE No. 1

(The Food Of Nestling Cattle Egrets)

FOOD ITEMS	PERCENTAGE BY NUMBER	PERCENTAGE BY WEIGHT
Annelida	1.8	0.5
Insecta	79.1	32.9
Arachnida	8.2	0.9
Amphibia	4.5	45.5
Reptilia	6.4	20.2
TOTAL	100	100

the latter. In the present study, however, the food samples collected from different nestlings of same age varied in mean length (Table-3), there being no relationship between food length and the age of nestling. It may be stated that mean length of food items may be dependent upon the available type of food.

(iii) **Variability of diet :** To illustrate the variability of diet, five different vomitted samples were examined. Samples contained the following items :

a. The sample collected on 13–5–84 contained 5 grasshoppers belonging to genus *Chrotogonus.*

b. The sample collected on 20–5–84 contained 1 *Chrotogonus* sp., 1 *Atractomorpha* sp., 6 *Acridium* sp., 5 *Hippasa* sp., and 5 *Leiolopisma* sp.

c. The sample collected on 26–6–84 contained 1 *Mantis religiosa,* 18 *Chrotogonus sp.,* 8 *Acridium* sp., 3 *Atractomorpha sp.,* 1 *Laxenecera sp.,* 1 *Theredon sp.,,* and 1 *Leiolopisma sp.,*

d. The sample collected on 7–7–84 contained 2 *Bufo* sp.

e. The sample collected on 26–7–84 contained 1 *Phyllodromia* sp., 1 *Chrotogonus sp.,* 1 *Locusta sp.,* 12 *Acridium sp.,* 14 *Acheta sp.,* 1 *Onthophagus sp.,* 1 *Lycosa sp.,* 1 *Bufo sp.,* and 1 *Calotes sp.,*

From above it is evident that there is some variation in the diet nestlings, naturally it can be the result of the availability of particular species in nature.

TABLE No. 2

The Detailed Food Analysis Of Nestling Cattle Egrets

Item	Number Taken	Percentage By Number	Weight (In Grams)	Percentage By Weight	Frequency Of Occurance (Per Cent)
INSECTA					
Fam. Acridiidae					
Chrotogonus sp.	63	23.4	19.223		63.1
Acridium sp.	58	21.6	10.984		57.9
Atractomorpha sp.	8	3.0	0.662		21.0
Fam. Gryllidae					
Acheta sp.	34	12.6	11.985		36.8
Tridactylus sp.	1	0.4	0.014		5.3
Fam. Tetrigidae					
Locusta sp.	8	3.0	12.441		26.3
Fam. Mantidae					
Mantis religiosa	2	0.7	1.201		10.5
Fam. Blattidae					
Phyllodromia sp.	3	1.1	0.068		10.5
Fam. Termitidae				31.5	
Termes sp.	25	9.3	2.185	1.2	5.3
Fam. Muscidae					
Musca sp.	5	1.8	0.042		15.8
Fam. Calliphoridae					
Cosmina sp.	2	0.7	0.020		5.3
Fam. Asilidae					
Laxenecera sp.	1	0.4	0.010		5.3
Fam. Scarabaeidae					
Onthophagus sp.	2	0.7	0.251		10.5
Fam. Carabidae					
Tetragonoderus sp.	1	0.4	0.046		5.3
ARCHNIDA				0.2	
Fam. Lycosidae					
Hippasa sp.	12	4.5	1.179		10.5
Lycosa sp.	3	1.1	0.269		10.5
Fam. Theridiidae					
Theredon sp.?	2	0.7	0.013		5.3
Fam. Linyphidae			0.045		10.5
Drapetisca sp.?	3	1.1	0.014		5.3

[2]

1	2	3	4	5	6
Fam. Salticidae					
Salticus sp.	1	0.4	0.014		5.3
Fam. Eusparassidae					
Palystes sp. ?	1	0.4	0.030		5.3
ANNELIDA				0.9	
Fam. Megascolicdae					
Pheretima sp.	5	1.8	0.861	0.5	10.5
AMPHIBIA					
Fam. Bufonidae					
Bufo sp.	12	4.5	81.500	45.5	31.6
REPTILIA					
Fam. Scincidae					
Leiolopisma sp.	12	4.5	18.753		31.6
Fam. Agamidae					
Calotes sp.	3	1.1	11.000		10.5
Eumeces sp.	1	0.4	1.000		5.3
Fam. Iguanidae					
Streptosaurus sp. ?	1	0.4	5.500	20.2	5.3
	269	100	179.296	100	

TABLE No. 3

Showing Relation Between Age and Meanlength Of Food Items Consumed By Nestling Cattle Egrets.

AGE (IN DAYS)	MEAN LENGTH OF FOOD ITEMS		
	SAMPLE 'A'	SAMPLE 'B'	SAMPLE 'C'
5	20,4 mm	21.7 mm	
10	10.7 mm	30,4 mm	
11	17.4 mm	22.8 mm	
17	14.4 mm	21.7 mm	31.8 mm
22	17.0 mm	50.0 mm	42.5 mm

(iv) Food requirement during growth : Relations between food consumed per percentage of body weight and weight increased per percentage of body weight in a captive nestling are given in Table-4.

TABLE No. 4

Showing Relation Between Food Consumed / Percentage Of Body Weight And Weight Increased / Percentage Of Body Weight Of Nestling Cattle Egrets.

Date	Food Consumed/ Percentage of Body Weight 'a'	Weight Increased/ Percentage of Body Weight 'b'	Relative Food Consumption $\frac{a}{b}$
17.7.84	49.3	33.3	1.4
18.7.84	55.0	25.0	2.2
19.7.84	66.0	20.0	3.3
20.7.84	60.0	16.6	3.6
21.7.84	65.7	14.2	4.6
22.7.84	63.7	25.0	2.5
23.7.84	60.0	20.0	3.0
24.7.84	56.0	8.3	6.7
25.7.84	53.3	57.6	7.0
26.7.84	51.4	4.2	12.2
27.7.84	54.1	5.4	10.0
28.7.84	62.3	6.4	9.7
29.7.84	62.1	9.7	6.4
30.7.84	70.0	11.1	6.3
31.7.84	66.0	15.0	4.4
1.8.84	65.2	13.0	5.0

[4]

1	2	3	4
2.8.84	40.0	11.5	3.4
3.8.84	41.3	6.8	6.0
4.8.84	39.3	12 9	3.0
5.8.84	42.8	5.7	7.5
6.8.84	40.5	7.5	5.4
7.8.84	40.7	1.5	27.1
8.8.84	28.7	6.4	4·4
9.8.84	38.6	6.9	5.5
10.8.84	48.6	6.5	7.4
11.8.84	40.6	6.1	6.6
12.8.84	35.3	1.9	18.5
13.8.48	35.0	5.6	6.2
14.8.84	28.5	3.2	8.9
15.8.85	27.3	1.3	21.0

In total, 1667.2 grams of food was consumed by the captive nestling in 30 days, out of which 30.1% was consumed during first fifteen days, averaging 33.5 grams daily. Food consumed during last fifteen days was 69.9% of the total, averaging 77.6 grams daily. There was no increase in growth rate (Table-5 and Graph-1) during first two weeks. But it became maximum during third week and afterward it started decreasing. The food consumption kept on increasing with age, the food thus consumed was used for activities other than growth.

(v) Feeding behaviour : The nestlings started feeding when they were about a day old. Blaker (1969) stated that the nestlings fed on bolus vomitted out by the parent on the nest as they were unable to hold the beak of the parent, till they were eight days old. Fowler (1960) and later Siegfried (1973) stated that they fed on the vomitted bolus on the nest upto seven days. In the present study, it was observed that nestlings started holding the beaks of the parents at 7-10 days of age and during this transition stage feeding was of both the types, the feeding on the vomitted bolus on the nest being less frequent. After they were ten days old no nestling was observed feeding on the bolus from the nest. Thereafter, the nestlings were strong enough to grab parent's beak, which was pulled down and was given few jerks to facilitate the easy transfer of food directly into their mandibular

pouch. The begging calls rendered by nestlings sounded 'zit-zit' (Skead, 1966) which became 'Zickle-Zickle' (Skead, 1966) with age.

TABLE No. 5

Growth Rate Of Captive Nestling Cattle Egret (Upto Five Weeks)

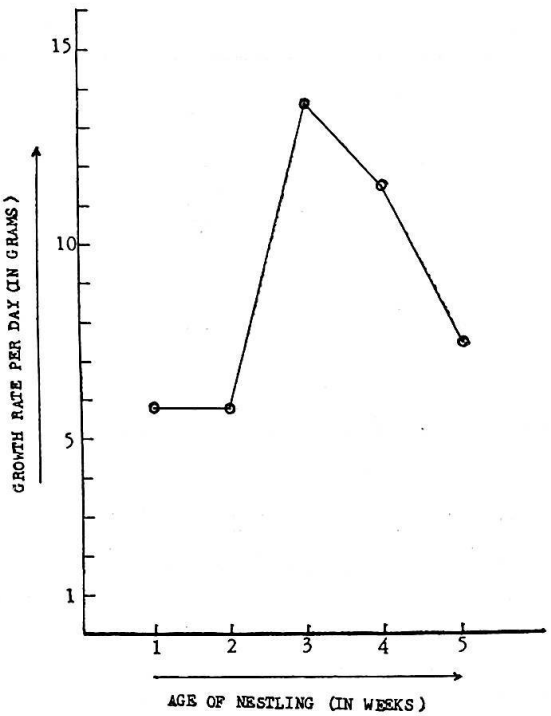
Age In Weeks $\delta t=7$	Weight In Grams m	Increase δm	Growth Rate Per Day (In Grams) During that week $\frac{\delta m}{\delta t}$
0	10	40	5.7
1	50	40	5.7
2	90	95	13.5
3	185	80	11.4
4	265	52	7.4
5	317		

Twenty five days old nestlings folded their wings upwards and forwards and with open beak making erratic forward and backward movements of necks, rendered harsh begging calls. After success in obtaining the food, similar activity was repeated with closed beak and bent neck.

The statement given by Lehmann (1959) that feeding of young was carried out throughout the day without difference in the activity at different hours of the day was confirmed in this study. Each parent made 1-4 trips per day, depending upon brood size and age of nestlings, for the procurement of the food and fed the nestlings 2-3 times during its stay. each feeding lasted 2-10 minutes. One of the parents guarded the nest when the nestlings were less than 12-15 days old, thereafter both the parents went for food hunting, though they feed the nestlings separately. Present study confirms Blaker's statement (1969) that more time was devoted for guarding a lone chick in the nest than the twins.

The nestlings were fed by the parent till they were 50-52 days old, after which they were capable of self feeding.

The feeding behaviour of the captive nestling was somewhat different. It started feeding when it was ten hours old, though with some assistance by placing the food in its beak. The food from the forceps was taken at the age of two days though it also picked food slipping out of the foreceps. Since the nestling was fed after taking it out from the cage, during the first five days whenever the nestling was removed from the cage it gave begging calls. Seventh day onwards it started begging calls after hearing creak of the door and movements in the laboratory.



GRAPH-I

SUMMARY

The food of nestling Cattle Egrets consisted of annelids, insects, arachnids, amphibians and reptiles. The consistent food item was grasshopper, *Chrotogonus* sp. No relationship between the mean length of food items and age of nestlings was found. Out of total food consumed by the captive nestling in 30 days, 30.1% was consumed during last fifteen days.

During first seven days the nestlings fed on the food vomitted on the nest by the parent 7–10 days were transitionary stage with both types of feedings, on the vomitted bolus from the nest and directly from the beak of

parent, though former was less common. After 10 days the nestlings exclusively fed directly from the beak of parent. The nestling were fed by the parents till they were 50–52 days old. The feeding behaviour of captive nestling was bit different.

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