

Food and Feeding Ecology of Cattle Egret (Bubulcus Ibis) in Federal College of Wildlife Management, New-Bussa, Niger State Nigeria

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Abstract – The dynamic nature of resources such as availability of cattle and nest tree availability for a variety of cattle egret species determine the movements, social structure, breeding season, productivity, and moult. Therefore, this study access the food and feeding ecology of cattle Egret in federal college of Wildlife Management, New-Bussa, Niger state for six months (January to June, 2019) using personal ground observation. The result revealed that the food list of cattle egret involves both animals and plants matter. The animals matter includes insects, Annilida and Arachinids. Insects form the highest percentage of the food composition especially Orthoptera. The plants matter includes Nectar of cotton plant and seeds of neem plant. The result also indicated that the bird is engaged in many activities during the day. Cattle egret diurnal activities include feeding, flying, perching and pecking. The highest activity was feeding while flying was the least. The part consumed are fruits, seed and animals. The part consume mostly is the seed, followed by the Fruit and the least is animals food source. The study concludes that Cattle egret are omnivorous animals but they fed mostly on insects of the order Orthoptera but they also fed on plants such as cotton and neem seed.

Keywords – Cattle, Egret, Ecology, Feeding

I. INTRODUCTION

The cattle egret (*Bubulcus ibis*) is a cosmopolitan species of heron (family Ardeidae) and they are found in the tropics, subtropics and warm temperate zones. It is the only member of the monotypic genus *Bubulcus*, although some authorities regard two of its subspecies as full species, the western cattle egret and the eastern cattle egret. Despite the similarities in plumage to the egrets of the genus *Egretta*, it is more closely related to the herons of *Ardea* (Rasmussen and Anderton, 2005). Originally native to parts of Asia, Africa and Europe, it has undergone a rapid expansion in its distribution and successfully colonized much of the rest of the world in the last century. It is a white bird adorned with buff plumes in the

breeding season. It nests in colonies, usually near bodies of water and often with other wading birds. The nest is a platform of sticks in trees or shrubs. Cattle egrets exploit drier and open habitats more than other heron species. Cattle Egrets are often found associated with cattle and occasionally with pigs, goats, and horses, and also with moving vehicles such as tractors (Seedikkoya *et al.*, 2005). They were also reported to be associated with other moving vehicles ((Mullarney *et al.*, 2001). Their association with grazing cattle helps increase their prey captures and utilizes less energy than those of solitary feeders (Mullarney *et al.*, 2001).

The demographic explosion and wide distribution of this species may be related to the increase of cattle-raising

activities, in addition to the lack of competition with other species and their biotic potential (Silva *et al.*, 1995).

Their feeding habitats include seasonally flooded grasslands, pastures, farmlands, wetlands and rice paddies. They often accompany cattle or other large mammals, catching insect and small vertebrate prey disturbed by these animals. Some populations of the cattle egret are migratory and others show post-breeding dispersal (Rasmussen and Anderton, 2005).

They can obtain their food from different environmental units of the aquatic system by means of the spatial differential use of the environment (Dutson and Watling, 2007). Egrets are able to exploit resources throughout the year and at different hours of the day. Many studies on the trophic ecology of Egrets, their association with habitats, food resources and feeding spectrum have been reported. Although Cattle Egret is very common and occupies a large geographic area, little is known about its feeding activity, with the only available contributions being those of Jobling (2010) in northern Argentina. The feeding can take place at any time of the day and depends on habit and foraging abilities of species and individual. The feeding method includes from a simple picking up a food item to more complex and energetic feeding like levering over object, digging into the ground, snatching, swooping, plucking and hawking. Food items are manipulated in different ways. They are simply swallowed whole by tossing a food item back from the bill tip into the throat. Some items are stripped of extraneous parts before being swallowed, such as fruits of their skins or insects of their wings and legs; some are softened before swallowing by passing them through and crushing them in the bill or cleaned of unwanted covering by being wiped back and forth over a perch or along the ground. Sometimes instead of swallowing, the food is for courtship feeding (Kemp, 1995). Fruits offer two basic types of energy rewards: carbohydrates in the form of sugars and starch, and lipids in the form of fatty acids. Lipid rich drupes and pods typically offer a higher quality energy source than berries and figs. This is because fats contain approximately 9cal/g versus 4cal/g dry weight for sugars (Robbins, 1993). Simple sugars are water-soluble and readily absorbed in the gut by both passive and active uptake (Kinnaird and O'Brien, 2007). There are few studies on the ecology of cattle egret especially in Nigeria, therefore a

knowledge of the food and feeding habit will provides a very important information on the ecology of this species.

II. MATERIALS AND METHODS

A. Study Location

Federal College of Wildlife Management is situated between Kainji Dam and New Bussa town along Awuru road. It lies between longitude 4°30'-4°33'E and latitude 7°-31-1' 00"N and covers an area of 256km² (Abu, 2003). The average monthly temperature is 34° with the highest values being 41°c. The mean annual relative humidity is 60% with a mean rainfall value of 104.45mm. Rain commence in March, get to its peak in July, August and declines in September (Onyeamusi and Obot, 1983).

III. METHODS OF DATA COLLECTION

The methods used for this study was direct observation, the direct observation was involves following the birds early in the morning between 7. 00 a.m. and 10.00 a.m and 4.00pm -6.00pm in the evening, the birds was watched feeding directly on the field. The food materials which the birds consumed were noted and identified and recorded in the research data sheets. Samples of the food material eating were collected for further observation. The studies covered a period of five months (February-June, 2019).

A. Data Analysis

Data generated were analyzed using descriptive statistics which comprises simple tables, percentages and frequency distribution.

IV. RESULTS

Table1 shows the checklist of food items consumed by cattle egret in the study area, it shows that the birds fed on wide variety of foods i.e it fed on both plants and animals which makes the bird to be omnivorous. The activity pattern of the birds was revealed in Fig1, the results shows that feeding was the highest activities that they spend most of their time on and follow by standing while flying was the least activity. Table2 showed the percentage of arthropods specie found in the diet of cattle egret, it reveals that orthoptera recorded the highest percentage (33.33%) follows by Formicidae (26%), Isoptera recorded 16%, coleoptera recorded 10.33% while the least is recorded amongst Arachinidae.

Table 1: Different Food items consumed by Cattle Egret (*Bubulcus ibis*) in the study area

Food Item		Order/Family	Name of Specie
ANIMAL MATTER	INSECTS	Orthoptera	Grasshoppers and Cricket
		Coleoptera	Beetles
		Lepidoptera	Butterflies Caterpillars
		Isoptera	Termites
		Formicidae	Ants
		Alphididae	Aphids
PLANTS MATTER	Annelida	Oligocheata	Earthworm
	Arachinids	Arachinidae	Tick and Spider
	Nectar	Malvaceae	Cotton plant
	Seeds	Azadirachta	Neem Plant

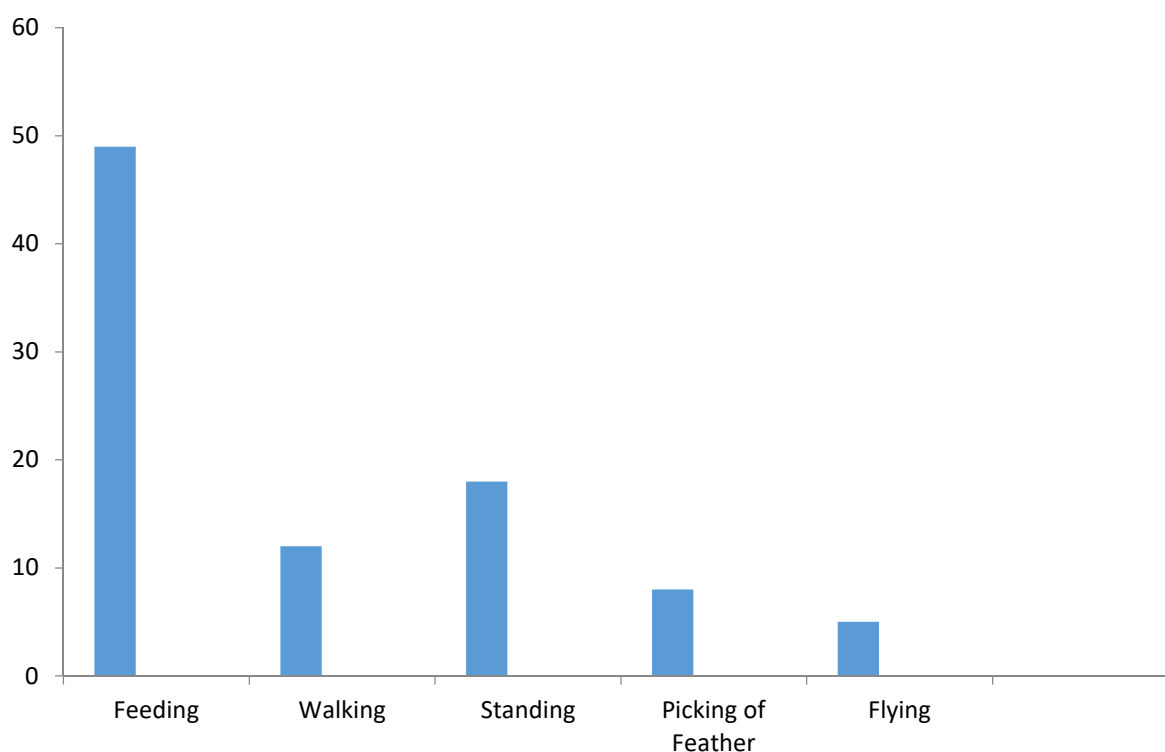


Fig 1: Activity Pattern of Cattle Egret

Table 2: Composition of Arthropod in the diet of Cattle Egret

Arthropod Specie	Percentage (%)
Orthoptera	33.33
Coleoptera	10.33
Lepidoptera	5.3
Isoptera	16
Formicidae	26
Alphididae	8.7
Arachinidae	2.1

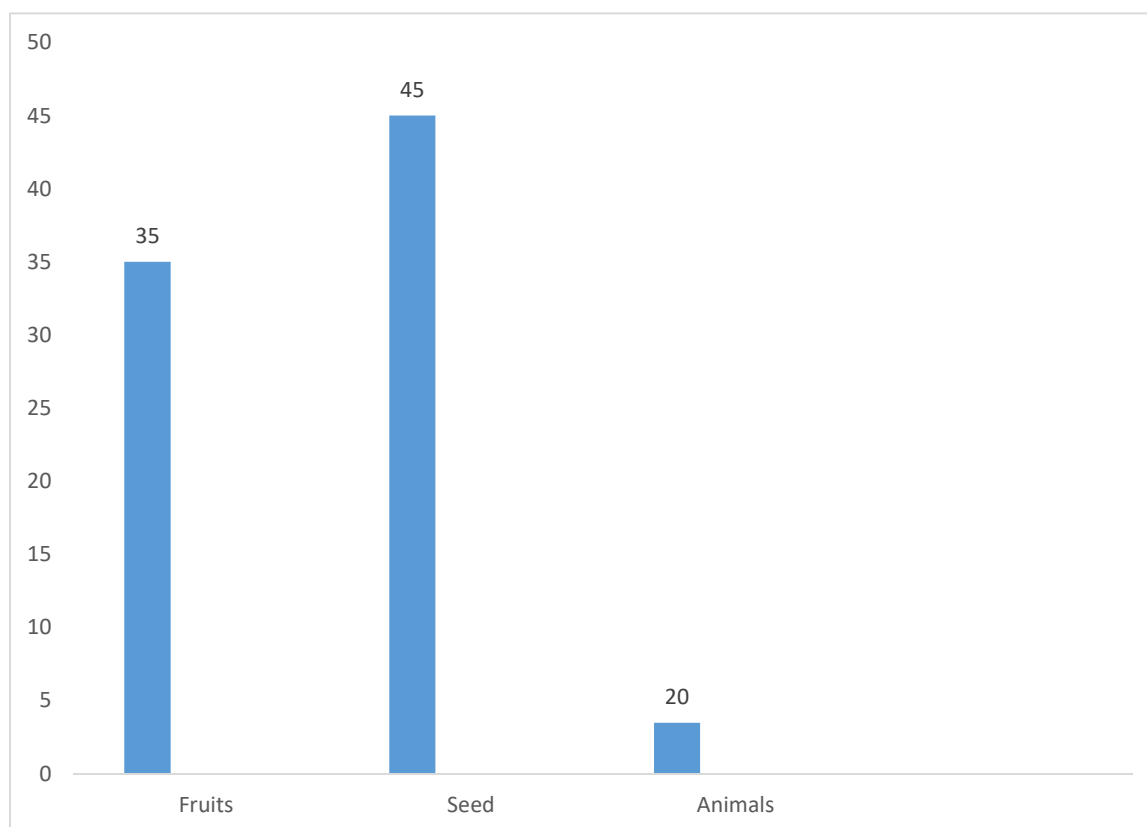


Fig 2: Proportion of food items consumed

The part consumed are fruits, seed and animals. The part consume mostly is the seed, followed by the Fruit and the least is animals food source.

V. DISCUSSION

Insects represent the main food of Cattle egret while plants were secondary categories. The results obtained basically agree with the works of Bo and Darrieu (1993) which reported that the diet of this heron is distinctly carnivorous, being 80% represented by invertebrates, mostly insects (orthopterous, coleopterous, dipterous and lepidopterous in decreasing abundance). There is also agreement on the fact that arachnids and plants represent a minor percentage of the food (Beltzer *et al.*, 1987). These authors report reptiles (Anguidae) as constituents of the egret's diet but these were not observed in the present study. Zaccagnini and Beltzer (1982) found a total of 25 taxonomic entities being insects the largest category, followed by amphibians, fish and arachnids. In the area of the Parana' River, Beltzer *et al.* (1987) found 11 taxonomic items highlighting the orthopterous as the largest followed by arachnids, amphibians and other insects. Others studies

elsewhere in its area of distribution agreed that the diet of the species is basically composed by insects of the order Orthoptera (Amat and Soriguer, 1981; McKilligan, 1984). Siegfried (1971) observed in South Africa a similar importance of Lepidoptera and Orthoptera. Siegfried (1971) and Torres and Gutierrez (1999) reported that the Cattle Egret's diet varied temporarily depending on the abundance of prey and indirectly depending on rainfall at some times of the year. Dietary selectivity was not significant, thus showing that the Cattle Egret has a high degree of plasticity in its diet. In these studies, cattle egret were seen to prey upon cattle ectoparasites which was in line with the result of Kaufman (1996) and Seedikkoya *et al.*, (2005). This is probably why they were always following the animal because they were sure getting their highly delicious food (Ash, 1992). According to Szijj (1965), usage of a particular habitat will be a function of, amongst other factors, food availability and accessibility. In agreement with this concept, the Cattle Egret demonstrated a differential use of pastures where food is obtained more easily. The preference for this type of environment is a characteristic feature of the basically insectivorous species.

VI. CONCLUSION

The feeding and breeding requirements are driving forces that determine how egret species locate and consume preferred food, and where to place their nests. The dynamic nature of resources such as availability of cattle and nest tree availability for a variety of cattle egret species determine the movements, social structure, breeding season, productivity, and moult. The results show that cattle egret is found in large numbers mostly with cattle and they are diurnal animals. They are omnivorous animals but they fed mostly on insects of the order Orthoptera but they also fed on plants such as cotton and neem plants. They spend most of the time feeding and the least of their time flying. Their food source are available throughout the year. Therefore, availability of food resources cannot be a factor contributing to a reduction in population of this bird in the study area. This study recommends that all efforts should therefore be taken to halt further decline in the population of this birds so as to improve its conservation status in the environment.

REFERENCES

- [1] Abu, O. (2003). Plants Abundance and Distribution in Sahel Savannah of Nigeria, *J. Forestry*, 23-43.
- [2] Amat, U and Soriguer, V.O. (1981). Interactions among host diet, nutritional status and gastrointestinal parasite infection in wild birds. *International Journal for Parasitology*, 34: 535-542.
- [3] Ash, S. (1992). Food and feeding of Egrets. *Journal of Zoo and Wildlife*, 1(1): 662-670.
- [4] Beltzer, E., Dei, P. and Deacon, J.W. (1987). *Introduction to modern Avian*. 2nd ed. Cambridge, MA: Blackwell Scientific.
- [5] Bo, S. and Darrieu, P.K. (1993). Utilization of Birds. *Vet Scan*, 4(1), Article 31.
- [6] Dutson, G.; Watling, D. (2007). "Cattle egrets (*Bubulcus ibis*) and other vagrant birds in Fiji" (PDF). *Notornis*. 54 (4): 54–55.
- [7] Jobling, J.A (2010). *The Helm Dictionary of Scientific Bird Names*. London: Christopher Helm. p. 201. ISBN 978-1-4081-2501-4.
- [8] Kaufman, K. (1996). Avian extinction and mammals on oceanic island" *science* 305
- [9] Kemp, A. (1995). *The Hornbills: Bucerotiformes*. Oxford: Oxford University Press Inc.
- [10] Kinnaird, M. F., & O'Brien, T. G. (2007). *The ecology and conservation of Asian hornbills: farmers of the forest*. Chicago: University of Chicago Press.
- [11] Mckilligan, I (1984). *Aves Adaptation and Evolution* (2nd ed.). San Diego: Academic Press. pp. 195–197. ISBN 0-12-260341-9.
- [12] Mullarney, Killian; Svensson, Lars; Zetterström, Dan; Grant, Peter J. (2001). *Birds of Europe*. Princeton University Press. ISBN 0-691-05054-
- [13] Rasmussen, P.C.; Anderton, J.C. (2005). *Birds of South Asia. The Ripley Guide*. Smithsonian Institution and Lynx Edicions. p. 58. ISBN 84-87334-67-9.
- [14] Robbins, O.D. (1993). Management Birds, *Journal of Science*, 3(1). Pp. 345-352.
- [15] Seedikkoya, K., Azeez, P.A. and Shukkur, E.A.A. (2005). Cattle Egret *Bubulcus ibis* habitat use and association with cattle. *Forktail*, 21, 174– 176.
- [16] Siegfried, R. (1971). Parasites of Laboratory Birds. *The Iowa State University Press*, Ames, Iowa. Pp. 203-301.
- [17] Silva, M.P.; Coria, N.E.; Favero, M.; Casaux, R.J. (1995). "New Records of Cattle Egret *Bubulcus ibis*, Blacknecked Swan *Cygnus melancoryphus* and White-rumped Sandpiper *Calidris fuscicollis* from the South Shetland Islands, Antarctica" (PDF). *Marine Ornithology*. 23: 65–66.
- [18] Zaccagnini, J. and Beltzer, P.J. (1982). Seasonal translation of Egret in Sahara Desert, *Aves Parasitology*, 99-116