RESEARCH PAPER | Zoology | Volume : 4 | Issue : 8 | August 2014 | ISSN - 2249-555X

Breeding Biology of Cattle Egret *Bubulcus ibis* in villages of Ludhiana, Punjab

KEYWORDS: Breeding biology, cattle egrets, clutch size, heronries

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ABSTRACT *The breeding biology of Cattle Egret Bubulcus ibis was studied during the breeding season of 2013 in two villages viz; Baranhara and Ladian Khurd falling in the district Ludhiana. There were located four heronries having a total of 47 nests at Baranhara and one heronry having 22 nests at Ladian Khurd. Breeding season of Cattle Egret was observed to extend from April to July First egg was laid during last week of May. The clutch size of Cattle Egret varied from 3 to 4. The egg laying activity peaked around end of the May to the end of June. Breeding pairs left the active nests after completing the breeding activities at the July end. The nests were built on Dhek tree (Melia azedarach) and Pilkan tree (Ficus lacor) up to height of 20 feet in Baranhara and Ladian Khurd respectively. The heronries were four times higher in number at Baranhara as compared to Ladian Khurd, which seemed to be linked to the presence of flowing water body at the former village.*

INTRODUCTION

Birds are the key species in an agricultural ecosystem for maintaining the ecological balance (Haslem and Bennett, 2008). The Cattle Egret *Bubulcus ibis* has a wide spread distribution around the globe. Cattle Egret belongs to the order Ciconiiformes and family Ardeidae (Ali 1996). Cattle Egret can also be seen in large flocks picking insects from the freshly ploughed fields (Patankar *et al*, 2007).

Studies on the breeding biology of Cattle Egret and other beneficial birds in different agro-ecological zones of Punjab have been in progress as per the mandate of All Indian Network Project on Agricultural Ornithology funded by Indian Council of Agricultural Research, New Delhi (Kler, 2005, 2009, 2010a, b; Kler and Kumar 2013). In this paper observations on the heronry site selection and breeding biology of Cattle Egret in two villages having different types of water bodies have been discussed.

MATERIALS AND METHODS

The study was carried out in two villages viz; Baranhara (N 30 50' 06, E 75 46' 12.79; 248 m above mean sea level) and Ladian Khurd (N 30 57' 01.57, E 75 47' 18.87; 248 m above mean sea level) falling in the district Ludhiana. A total of five heronries consisting of 69 active nests were located in the study area. Out of which four heronries having 47 nests and one heronry having 22 nests were regularly observed at Baranhara and Ladian Khurd respectively. Observations were taken as per the methodology given by Javed and Kaul (2002). All accessible nests were marked and recorded for pair formation, courtship, nest building, mating, egg laying and hatching of eggs. The number of young ones hatched was also recorded.

RESULTS AND DISCUSSION

Cattle Egret is known to nest in the mixed colonies with cormorants, ibises and other members of family Ardeidae (Ali and Ripley 1968, Maccarone and Parson, 1988). Cattle Egret nesting has been observed in heronries. Amongst the colonial nesting birds, egrets use only dry and naked twigs. It was recorded that they usually built nests on trees, shrubs or bushes, swamp or mangroves (Ali and Ripley 1968). It is also known to nest in a monospecific colony with no other Ardeidae member nesting in the neighborhood (Arendt and Arendt 1988). In Gujarat, the breeding season of Cattle Egret has been reported from April to July (Patankar *et al.,* 2007). Cattle Egret was noted to breed from April to August in a study carried out in the Central India (Joshi and Shrivastava 2012). Little information on the breeding biology of Cattle Egret is available from the Punjab state (Dhindsa and Saini 1994). Earlier studies on avian diversity have shown Cattle Egret as one of the most common beneficial species in agricultural habitats of Ludhiana (Kler 2009, 2010a,b; Kler and Kumar 2013).

In the present study, heronries of Cattle Egret were located in villages viz; Baranhara and Ladian Khurd of Ludhiana district. The heronries in the Baranhara were located in the school premises. These villages were different in features like presence of water bodies and green cover (number of traditional trees in the villages). Baranhara village is situated near flowing water body Buddha Nullah while Ladian Khurd is having only village pond. The heronries were situated at a distance of 160 m from the water body in Baranhara and 180 m from village pond at Ladian Khurd. Large tract of agricultural land in Baranhara is under agroforestry plantation. Baranhara is rich in number of old traditional trees in the village lanes and residential houses. It was recorded that the bird species richness was also more in Baranhara as compared to the Ladian Khurd (Author's unpublished data).

The nest building activity of Cattle Egret was observed during the second fortnight of April in the said villages. There were recorded four complete heronries (47 nests) at Baranhara and one heronry (22 nests) at Ladian Khurd by the middle of May. Cattle Egret heronries were built on Dhek tree (*Melia azedarach*) and Pilkan tree (*Ficus lacor*) up to height of 20 feet in Baranhara and Ladian Khurd respectively.

Volume : 4 | Issue : 8 | August 2014 | ISSN - 2249-555X

Table 1. Breeding activities observed at the heronries in Baranhara and Ladian Khurd villages.

Villages	Heronries	Number of nests per heronry	Average clutch size	Average incubation period (days)	Average hatching %	Nesting period (days)	Nesting success %
Baranhara	Heronry 1	13	3.53	22.53	50	14.23	75
	Heronry 2	9	3.53	23.88	100	15.0	75
	Heronry 3	14	3.64	23.85	75	14.85	50
	Heronry 4	11	3.63	21.18	50	15.75	50
	Total	47	3.58	22.86	56.25	14.95	62.5
Ladian khurd	Heronry 1	22	3.0	23	75	15.55	50

The present study has found that the breeding season of Cattle Egret extends from April to July in Ludhiana district. The nest building was observed to be carried out by both males and females. Nests were made up of twigs and vegetation material gathered from surrounding crops and wild plants. Mating was mostly observed in the early morning hours. It was observed that the egg laying started in the third week of May in all the heronries. Majority of the nests were having new born chicks in the second week of July. The average clutch size and average incubation period (days) was 3.58 and 22.86 in Baranhara respectively. Both parents were observed incubating the eggs. Average hatching success (%) was 56.25 in Baranhara were recorded. The average nesting period (days) and nesting success (%) were 14.95 and 62.50 Baranhara respectively. The average clutch size and average incubation period (days) was 3.0 and 23.0 in Ladian Khurd village respectively. Average hatching success (%) was 75.0 were recorded.. Predation of chicks in heronries by House Crow, Shikra *Accipiter badius* and snakes had been observed. The mixed nesting and roosting associations with other bird species were not observed in the studied heronries. It seems from the present observation that there is a shift in the nesting preference of Cattle Egret for Dhek tree in tune with the scarcity of traditional trees like *Acacia spp.*, in villages. Hatching success was more at heronry at Ladian Khurd, having higher nesting density as compared to heronries present at Baranhara village, this may be due to group benefits such as improved vigilance or reduced probability of attack by predators.

Previous studies had mentioned Cattle Egret breeding period from June to August and up to five clutch size per season (Ali and Ripley 1974). Gopal *et al.* (2004) had observed Cattle Egrets sharing their roosting sites with a number of other birds. On trees, they showed roosting associations with Indian Pond Heron *Ardeola grayii*, House Crow *Corvus splendens* and Common Myna *Acridotheres tristis* whereas on the ground, they rested with a number of water birds. Masterson (2007) noted that incubation of the eggs was done by both the male and female and last for 24 days. Males and females both fed the young and may continue to feed and protect the young up to three weeks after fledging (Masterson 2007). Frankis *et al.* (2012) found that female laid 3-4 pale blue eggs, laying one every two days.

Cattle Egret is considered as a biological pest control agent and hence is an important bird in an agro-ecosystem (Rao 2004). Therefore, awareness programmes about the beneficial status of Cattle Egret in agricultural ecosystem at village level is recommended so as to protect their heronries from anthropogenic activities.

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