



Short Communication

Breeding performance of black crowned night heron- (*Nycticorax nycticorax*) in Ahmedabad, Gujarat, India

Patel Haresh G.

Department of Zoology, M.G. Science Institute, Navrangpura, Ahmedabad, Gujarat, India
hgpatel1974@gmail.com

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Abstract

Breeding performance of the Black Crowned Night Heron- (*Nycticorax nycticorax*) was studied in Ahmedabad, Gujarat during January 2015 to December 2015. The population of *Nycticorax nycticorax* was observed in wetlands of the study area. During study period 21 nests were seen. Breeding period starts from July and extend up to September 2015. Black Crowned Night Heron mostly preferred the large leafy trees for nest building. Different species of plants were preferred for nest building by this bird species. Success of Hatching 62%, success of Nestling 56% and success of Nesting 35% was observed. Low breeding success of *Nycticorax nycticorax* was observed. Predation, food availability, heavy rainfall, high wind velocity was the reasons for the low performance of breeding.

Keywords: Breeding, nest, clutch size, nestling, black crowned night heron - (*Nycticorax nycticorax*).

Introduction

Breeding biology plays its important role in community ecology or population ecology. Breeding season of an avian population in a specific area has a limited span. At each locality the breeding conditions vary seasonally and annually, as also the survival rates of juveniles and adults. One of the most fascinating aspects in the life of birds is their breeding phase, which is intimately tied to the distribution and abundance of food resources in their environment.

Black Crowned Night Heron- (*Nycticorax nycticorax*) is a wetland bird found in the Ahmedabad region. The wetlands of Ahmedabad provide an ideal habitat for this colonial nesting bird. There are dynamic locations where they nest every year. *Nycticorax nycticorax* is common breeder as well as resident in this area.

Black Crowned Night Heron is Ashy grey above with glistening black back and scapulars, white below. Crown, nape and long occipital crest black, the last with some white plumes intermixed. Young birds are streaked brown. The same communal roosts and nesting trees are occupied year after year. They Feeds on Crabs, fish, frogs, aquatic insects, etc. Mukhopadhyay described the breeding biology of Open bill Stork in Southern Bengal¹. Sivasubramaniam reported the basic data on the breeding biology of the colonial nesting birds of Keoladeo National Park². Dave reported the breeding biology of the colonial nesting birds at Rajkot in Saurashtra³. Acharya and Vyas gave some information regarding breeding biology of wetland birds in North Gujarat⁴⁻⁵. The paper is dealing with the

different aspects of performance of breeding in the Black Crowned Night Heron- (*Nycticorax nycticorax*).

Material and methods

Climate of study area is almost dry and in the monsoon season, it is semi-dry to humid type. It is periodic and seasonal. Ahmedabad experiences three distinct seasons namely winter (November to February), summer (March to June) and monsoon (July to October). Months of October and March mark the transition period from monsoon to winter and winter to summer respectively. Field visits were done weekly during the study period. Morning session was from 6.30 to 9.30 am and session of evening from 3.30-6.30 pm. Nikon SLR photographic camera and a 10X50 Binocular (Olympus) was used for Observation of the Black Crowned Night Heron. Total 270 hours of time was spent in the study field and total 21 nests were observed during breeding season (2015). Also the nests and other activities of this species observed. The birds were followed when they carry food, to locate nest. During egg laying period nest was checked day to day and three to four day intervals during periods of incubation and hatching. When hatching was completed visit was regularly done to checking the chicks hatched, until nest were leaved by chicks.

Results and discussion

Total 21 nests were studied during 12 months of the study period. At Ahmedabad area 1st week of July to 4th week of September is the peak of breeding period of *Nycticorax nycticorax* (Table-2). The Peak of nesting week of Black Crowned Night Heron- (*Nycticorax nycticorax*) is 1st week of September.

Table-1: Meteorological data of study area during year 2015.

Month	Average Minimum Temp (°C)	Average Maximum Temp (°C)	Monthly Rainfall (mm)
January	8.1	32.3	0.0
February	11.2	34.1	0.0
March	21.4	39.9	0.0
April	25.3	41.1	10.6
May	26.2	42.8	0.0
June	27.7	38.3	126
July	23.2	37.2	334.2
August	26.5	33.1	159.9
September	23.9	40.5	212.1
October	18.6	33.7	84.2
November	20.3	34.1	0.0
December	9.2	31.2	0.0

Table-2: Breeding season of Black Crowned Night Heron (*Nycticorax nycticorax*) during year 2015.

Nesting activity	Breeding season
Initiation of Nesting week (A)	July 1 st
Peak of Nesting week (B)	Sept. 1 st
End of Nesting week (C)	Sept. 4 th
No. of weeks of Nesting	12

A. Week when the earliest nests were started. B. Week when the maximum number of active nests were recorded. C. Week when the last chicks left the nests.

Table-3: Breeding schedule of Black Crowned Night Heron (*Nycticorax nycticorax*) during year 2015.

Breeding activity	Breeding schedule (Days)
Nest building period	6
Egg laying period	6
Incubation period	21
Nestling period	44
Complete nesting cycle	80

Nesting sites and nest: Black Crowned Night Heron mostly preferred the trees with large leaves for nest building. *Nycticorax nycticorax* select plant species for nest building like *Neem-Azadirachta indica*, *Pipal-Ficus religiosa* and *Goras amla-Pithocellobium dulce*. At the time of breeding male and female both take part in the construction of nest. Dry branches and twigs of plants scattered on the ground were used for nest building. The nesting material was re-used very commonly. The male brings the materials and the female arranges them. The nest is completed within about six days. Mostly the birds select different height of trees for building their nests. *Nycticorax nycticorax* prefers 12.5 to 13.5 m height, 10.04 m. canopy diameter and 1.61 m. GBH for nest construction.

The Eggs: The colour of eggs is pale sea-green. Average egg weight was 33.42±0.80g. Average length and breadths of eggs were 50.3mm±1.4 and 36.1mm±1.5. According to Takagi females that produce larger eggs should favor by the nature⁶. Horak et al. stated that energetic demands and willingness of female to produce more offspring might be in conflict with high investment into size of eggs⁷. Patel stated that in different months the mean shape of egg does not differ⁸. According to Schiff ferli the size of egg and survival of nesting are positively correlated in most bird species⁹. Relation in index decreased of shape as well as increased weight of egg was stated by Reddy et al¹⁰.

Size of Clutch: Without any interruption total number of eggs which are laid in a series refers size of clutch. *Nycticorax nycticorax* has the clutch size was 3-4. Total 21 nests were observed with 3-4 clutches. According to Vijayan there is correlation between the clutch size and food availability; when food is abundant the larger clutch is laid¹¹. Clutch of bird is a hereditary characteristic stated by Lack¹². The reduction of clutch size under the risk of nest predation has to be adaptive for least two reasons observed by Roff¹³.

Period of Incubation and Nestling: The time when first egg is laid and that egg is hatched refers Incubation period. It is also considered by Skutch and Nice^{14,15}. The interval of time the last chick of the brood remained in the nest is the nestling period. In *Nycticorax nycticorax* the incubation period was observed 21 days. The young fledge and leave the nest after about 44 days. In *P. cafer* incubation period 14 days and the time of nestling 12 days stated by Ali and Ripley¹⁶.

The temperature shows effect on period of incubation in *C. livia* observed by Patel. According to Dhanda and Dhindsa in a brood the number of young, nest height, parents age and productivity of habitat effects on nestling period¹⁷. The period of nestling dependent on hours of light and incubation period on temperature.

Hatching, Fledgling and Breeding Success: Produced young ones from eggs in a clutch is success of hatching. At the time of hatching a single male or female was found in the nest that is

why moderate success of hatching is observed. For average hatching success heavy rainfall, high wind velocity and sometimes predators were responsible. Nestling deaths and predation are the factors effects on success of fledgling. Fledgling success is also influenced by starvation and heavy rainfall with high wind velocity. The chicks fledged from a brood refer Fledgling. “When one or more young from a clutch of eggs survives to fledging are occurs” is the success of breeding. During study period of 12 months the success of breeding of *Nycticorax nycticorax* in Ahmedabad observed exceptionally low. Out of 69 eggs of *Nycticorax nycticorax* only 24 nestling fledged. According to Ali in *P.cafer* no one was fledgling that flew out of six nests¹⁸. It might be because of condition of environment, care of parents, place and time. Success of breeding is also inhibited by some ecological factors. These are predators such as House crow and Black kite, heavy rainfall, high wind velocity. Poor performance of breeding but moderate success of hatching and fledging is seen in *Nycticorax nycticorax* (Table-4). 1st week of July to 4th week of September was the breeding season. Place for nest, materials for nest and good sources of food available in this area, still predation, factors of environment and shortage of food causes low success of breeding in *Nycticorax nycticorax*. Currently *Nycticorax nycticorax* has well population in this area because of well adaptation of adults with food and vegetation respectively.

Table-4: A summary of the breeding performance of Black Crowned Night Heron- (*Nycticorax nycticorax*).

Summary	Year 2015
Total nests	21
Clutches	21
Clutch size	3-4
Total eggs laid	69
Hatched	43
% of hatched	62.31
% of egg loss	37.69
Fledged	24
% of fledged from hatched	55.81
% of fledged from total eggs laid	34.78

Conclusion

The study area is under unprecedented of urbanization activities. The poaching and predator pressure is also high as it is easy to the predators and poachers for sighting the breeding birds. Due to continuous modifications the area may lose its microhabitat

value and ultimately affecting the population and breeding performance of *Nycticorax nycticorax*. The study proved that, if the present ecological characteristics of wetlands of Ahmedabad continuous, the *Nycticorax nycticorax* will unable to inhabit this habitat in future. Proper awareness regarding the importance of birds and vital role in daily life to the local peoples through different programs will ultimately help the protection of bird species of this region. Some areas where the heronries are present should be declared as a protected area.

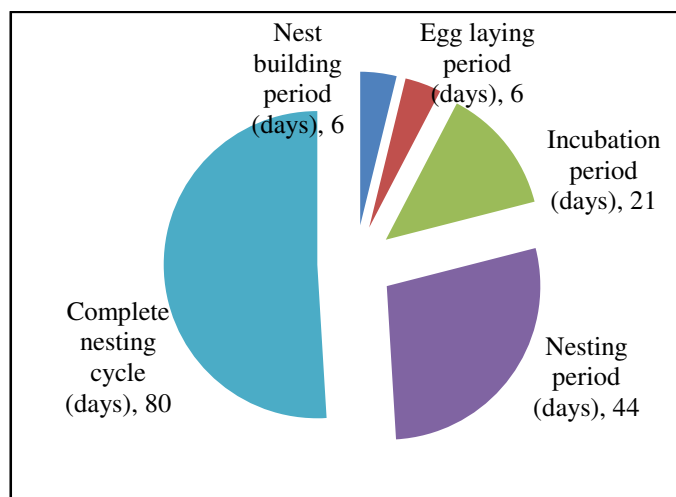


Figure-1: Breeding schedule of Black Crowned Night Heron- (*Nycticorax nycticorax*) during year 2015.

References

1. Mukhopadhyay A. (1980). Some observations on the biology of the Openbill Stork: *Anastomus oscitans* (Boddaert) in Southern Bengal. *J. Bombay Nat. Hist. Soc.*, 77(1), 133-137.
2. Sivasubramanian C. (1992). Ecological investigation on the piscivorous birds in Keoladeo National Park, Bharatpur. (Doctoral dissertation, Ph. D. Thesis submitted to Saurashtra University, Rajkot).
3. Dave S.M. (2002). Ecological study on the Piscivorous Birds of the semiarid area, Rajkot. Ph.D. Dissertation submitted to Saurashtra University, Rajkot.
4. Acharya C.A. (2003). Ecological study on Wetland birds at semi-arid condition of tropical farming area around Visnagar - North Gujarat. Ph.D. Thesis. North Gujarat University, Patan.
5. Vyas B.M. (2005). Ecological study on urban birds at Visnagar city-North Gujarat. (Doctoral dissertation, Ph. D. Thesis, Hemchandracharya North Gujarat University, Patan).
6. Takagi M. (2003). Seasonal change in egg volume variation within a clutch in the Bull-headed Shrike (*Lanius bucephalus*). *Canad. J. Zool.*, 81(2), 287-293.
7. Hōrak P., Mänd R., Ots I. and Leivits A. (1995). Egg size in

- the Great Tit *Parus major*: Individual, habitat and geographic differences. *Ornis Fennica*, 7(3), 97-114.
8. Patel M.I. (1986). Ecological studies on the Feral Pigeon in a tropical urban area. Ph. D. Thesis, Saurashtra Uni. Rajkot.
 9. Schifferli L. (1973). The effect of egg weight on the subsequent growth of nestling Great Tits *Parus major*. *Ibis*, 115(4), 549-558.
 10. Reddy P.M., Reddy V.R., Reddy C.V. and Rao P.S.P. (1979). Egg weight, shape index and hatchability in Khaki Campbell duck eggs. *Indian Journal of Poultry Science*, 14, 26-31.
 11. Vijayan V.S. (1978). Breeding biology of bulbuls, *Pycnonotus cafer* and *Pycnonotus luteolus* (Class: Aves, Family: Pycnonotidae) with special reference to their ecological isolation. *J Bombay Nat Hist Soc*, 75, 1090-1117.
 12. Lack D. (1954). *The Natural Regulation of Animal Numbers*. Oxford University Press, London.
 13. Roff D.A. (1992). *The evolution of life histories: theory and analysis*. New York Chapman & Hall. Safriel, U.N.
 14. Skutch A.F. (1945). Incubation and nesting period of Central American birds. *Auk*, 62, 8-37.
 15. Nice M.M. (1954). Problems of incubation periods in North American birds. *The Condor*, 56(4), 173-197.
 16. Ali S. and Ripley S.D. (1971). *Handbook of the birds of India and Pakistan*. Oxford University Press, Bombay, 6.
 17. Dhanda S.K. and Dhindsa M.S. (1998). Breeding ecology of Common Myna (*Acridotheres tristis*) with special reference to the effect of season and variable. *J. BNHS.*, 95(1), 43-56.
 18. Ali S. (1930). Casualties among the eggs and young of small birds. *Journal of the Bombay Natural History and Society*, 34, 1062-1067.