REVISTA DE LA ASOCIACION DE CIENCIAS NATURALES DEL LITORAL
22 (1): 35-40 (1991)

ASPECTS OF THE BREEDING BIOLOGY AND THE DEATH RATE OF THE *Butorides striatus* (AVES: ARDEIDAE)

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RESUMEN

Beltzer, A.H. 1991. Aspectos de la biología reproductiva y de la mortalidad de *Butorides striatus* (Aves: Ardeidae). *Rev. Asoc. Cienc. Nat. Litoral 22* (1): 35-40

La reproducción de la garcita azulada (*Butorides striatus fuscicollis*), escasamente documentada hasta la fecha, ha sido estudiada en el predio del Instituto Nacional de Limnología (INALI), obteniéndose información sobre algunos aspectos de su biología reproductiva. La postura se inició en noviembre de 1986. Se dan a conocer algunos datos sobre la nidificación y reproducción, referentes a la tasa de natalidad, la mortalidad cruda y por edades y causas. Se señala un comportamiento colonial no indicado para esta especie en el área de estudio. Se observó que un 75% de los huevos eclosionados alcanzaron el estado de juveniles con capacidad de vuelo.

ABSTRACT

Beltzer, A.H. 1991. Aspect of the breeding biology and the death rate of the *Butorides striatus* (Aves: Ardeidae). *Rev. Asoc. Cienc. Nat. Litoral 22* (1): 35-40

The Green Heron (*Butorides striatus fuscicollis*) breeding was studied in the landed property of the National Institute of Limnology (INALI). The laying began in November 1986. The reproductive strategy, nesting, natality and mortality rates and mortality reason were analized, it was observed that 75% of the hatched eggs reached the juvenile state of flying.

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0325 - 2809/91/2201 - 35 $ 2.00

INTRODUCTION

The Green Heron *Butorides striatus fuscicollis* Vieillot, 1817 has in Argentina a geographic distribution which extends from the North up to Río Negro; besides, Paraguay, Uruguay, Southern Bolivia and, accidentally up to Chile (Olrog, 1968).

The available information about the species refers basically to its geographic distribution, feeding, etc. (de la Peña, 1980; Beltzer, 1983; Salvador y Narosky, 1985), no studies have been made on the breeding biology of the Green Heron in Argentina.

The presence of a breeding colony in the outskirts of INALI, gave the opportunity of making first observations on the patterns of nesting behaviour.

MATERIAL AND METHODS

Observations were made on 12 pairs of birds that nested in the period from November-December 1986 to January 1987, in a dense arboreal formation in the outskirts of the National Institute of Limnology (INALI) next to the Salado River in Santo Tomé City (Santa Fe Province).

The study area includes a forest patch of 1500 m^2, densely covered by *Melia azedarach* and *Phytolaca dioica*, with an average height of 10-15 metres. The observations were made bare eyed and with binoculars (8x30 and 7x50) because the arrangement of the buildings of INALI and the existent wiring made impossible the use of a hydroelevator.

Observations of nesting and breeding pairs were carried regularly and the cohort was followed, being understood for that, the stages that go from the laying of the eggs up to the juveniles in state of flying pigeon.

For the breeding, evaluation was followed measuring the size of the brood for breeding period. The specific birth rate was reckoned according to the following equation: $\Delta N_n / N \Delta t$ where N_n is the number of eggs, N the numbers of pairs and the time.

With regard to the death rate, the raw death rate was estimated according to: $Mc = [(No - Nt) / No] . 100$, where No is the initial number of individuals and Nt the final number. In the same way the raw death rate per age was estimeted (M_E) and the specific death rate by reasons is given by the following equation: $Mc = 1 - (1 - C_1) (1 - C_2) (1 - C_3)$, where C is the reason of death rate identified by every subindex (1, 2, 3). The following classes of ages were eggs, nesting, fledgeling.

RESULTS

In all the cases the nests were placed on the top of the trees with irregular spacing among them and without apparent aggresive behaviour among the breeding pairs. Although de la Peña (1976) points out that this species lays up to 5 eggs, the clutches found did not surpass 4 eggs. The characteristics of the nests are similar to those described by de la Peña (1976, 1978, 1980, 1987). In this particular case, the herons used branches of *Olea europea* existing in the nesting area.

The patterns of colouring of the eggs are in accordance with published results from elsewhere. The construction of the nests was not synchronous in the 12 pairs, and these fase by batched nestings were next to newly fledgedones. It can be pointed out that in mid-November all the nests had eggs in different stages of incubation and, apparently, male and female would participate in incubation.

Based on an average of 4 eggs per nest, in mid November the 12 pairs laid 48 eggs, what means an specific rate of 0.26 in 15 running days.

Relating to the raw death rate (M_c) 48 eggs were considered as initial individuals and 36 as final numbers (5 eggs were found fallen), 3 juveniles were found dead after 2 succesive storms and the remaining 4 juveniles disappeared owing to unknown causes (predators?).

The raw death rate amounted to 25% whereas the specific death rate by ages was the following: egg= 10,4%; Hatched= 0%; Non flying juvenil= 15%; Flying juvenile= 0%.

To classify the mortality, the causes for losses were considered: C_1= falling the eggs; C_2= unfavourable environmental conditions (storms); C_3= unknown cause (predators?). The results are shown in table 1.

DISCUSSION

Nesting of *B. striatus fuscicollis* in Argentina follows the patterns described by Hancock and Elliot (1978) and Hancock and Kushlan (1984) which give a nesting height between 5 and 10 m. But for the area,de la Peña (*op. cit.*) points out that in natural environments which are not disturbed, the species builds up its nest in rushes, trees or bushes sometimes at a low height from the ground (1.5 m). For the location under study, the height, between 10 and 15 m would be an adjustment to the constant human presence. On the other hand, Thomas (1979), Da Rosa Pinto (1983), Olrog (*op. cit.*) and Hilty and Brown (1986) points out that the Green Heron is a species that nest in a solitary way, while Hancock

Table 1

Classification of the mortality of *Butorides striatus* by causes

	Time	Agent	%	Rate of mortality
eggs (2)	XI-86	fallen	0,041	
				0,104
eggs (3)	XI-86	fallen	0,065	
juvenil (1)	XII-86	fallen	0,022	
				0,071
juvenil (2)	XII-86	fallen	0,050	
juvenil (3)	I-87	?	0,075	
				0,103
juvenil (1)	I-87	?	0,027	

and Elliot (1978) and Coffey (1966) report that nesting is normally solitary, but some are collonial nesters.

Based on the observations, from the 12 pairs studied, a total of 36 nestlings reached the stage of juveniles with the capacity of flight and that presents a 75% of the total of the hatched eggs.

This is somewhat improved when using the values obtained by the determination of the specific death rate according to the stages of development and causes of loss. Referring to the stages, that of the eggs shows only a mortality of 10.4% and the hatches, then losses rise to 15% death rate of the non flying juveniles.

Relating to the death rate by causes, it can be pointed out that the agents of death have relatively similar weight, and in the case of the eggs it is due to the falls because of the simplicity of the nest in its technique of building, this appreciation is valid for the falls of the nestling in adverse environmetal conditions (storms).

Finally, it can be pointed out that in November 1987, 20 nests were occupied again in the area and that further studies (observations, banding of adults

and juveniles) would bring more knowledge concerning the breeding biology of this species.

ACKNOWLEDGEMENTS

To Dr. Juan A. Schnack (ILPLA) and Dr. Julio R. Contreras from (PROBBAS) for their valuable sugestions.

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Recibido / *Received* /: 27 febrero 1990
Aceptado / *Accepted* /: 20 febrero 1992