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Breeding Behaviour of a Territorial Female Shelduck *Tadorna tadorna* in Sebkget Oulad Amara Khenchela, Algeria.

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ABSTRACT

We have studied the diurnal time budget of a breeding female of the Shelduck Tadorna tadorna (focal method) in sebkhet Oulad Amara wilaya of Khenchela Algeria in 2004. The study shows that the main activities are: feeding, incubation and preening. Sleeping is made during the incubation period. The female is often in the den except some visits to the feeding territory during the day. The mean time allocated by each activity is: 19.98 %, 75.67 % and 4.33 % for feeding, incubation and preening respectively.

Keywords: *Tadorna tadorna*, preening, incubation, feeding and territory.

INTRODUCTION

Shelduck *Tadorna tadorna* in Algeria is a part of the dispersed Mediterranean/Black Sea population, which is scattered across both sides of the Mediterranean Sea [1 , 2]. The North African region may also be an important wintering area for the migratory Northwest European population [3, 4].

Sporadically in the past, the Algerian population was estimated to range between 1,500 and 5,100 Shelducks in 1971 in the wetland complex of Oum El Bouaghi, a region also known as the 'Constantinois' [5]. Numbers were subsequently estimated by Walmsley [6, 4] to vary between 1,000 and 7,500 with a mean value of 4,000. A midwinter count of 3,160 birds was recorded in January 1994 [3].

The Shelduck is a breeding species in the lake of Halloula and Fetzara according to some reports [7,8,9] and in Boughzoul according to various observations. No systematic study on the ecology of the shelducks has been undertaken in Algeria, neither on breeding or wintering behaviour nor on the breeding ecology [10].

The present study is aimed to follow the breeding behaviour of the Shelduck females during the breeding period in 2004, in sebkhet Oulad amara Khenchela. More than 45 broods were observed.

We also followed the diurnal behaviour of t breeding female during all the breeding period in 2004, through the evolution of its time budget, basing on three activities: feeding, preening and incubation.

MATERIALS AND METHODS

2. Study area and method:
Sebkhet Oulad amara usually called Tazougart (35 ° 23.777'N N, 7 ° 19.920'E E) 950 ha, is a stretched salted lake, divided into a series of units, among which two are well known under the names of Sebkhet Ouled Amara and Sebkhet Ouled Ambarek, fed by Oued Ounrhal. Several species were observed during the wintering period, such as common Shelduck, Ruddy Shelduck, and gadwall.

RESULTS

The study of diurnal time budget of a Shelduck breeding female at Sebkhet Oulad Amara in 2004, using focal method, shows that the main activities are sleeping, incubation and preening. Sleep generally occurs during the incubation in the burrow. The average seasonal percentage of time spent in feeding, incubation and preening by the female is 19.98 %, 75.67 %, and 4.33 % respectively (tab. 1), that is to say a daily rate equal to 143.45mn, 544.82mn and 31.17mn respectively.

Tab.1. rate of diurnal activities of shelduck breeding female during the breeding period:

Activity	Percentage (%)
Feeding	19.98
Incubation	75.67
preening	4.33

The number of visits made by the female to the feeding territory varies according to the reproduction phase and generally ranges between 2 and 5 per days. The average seasonal time spent in feeding equals 28.21 ±3.45mn, (Rang): (20-35mn), n 33, for the incubation it equals 100.91 ± 27.28mn, rang: (62-162mn), n = 35 and equals 6.12 ± 1.9 for preening, with a rang: (3-10mn), n = 34 (tab. 2).

Tab.2: mean seasonal time spent in each activity by Shelduck female in the breeding.

Activities	Min (mn)	Max(mn)	Mean (mn)	N
Feeding	20	35	28.21 ± 3.45	33
Incubation	62	162	100.91 ± 27.28	35
Preening	3	10	6.12 ± 1.9	34

We distinguished two breeding phases, the laying period and the incubation period. The time proportion spent in each activity varies from one phase to another. In the first days of the laying period, the male and female were observed together several times during the day, and they spend a lot of time in the feeding territory. The average feeding, incubation and preening rates for this period are equal to 28.89 %, 64.38 % and 6.71 % respectively (tab 3), that is to say daily periods equivalent to 205.12mn, 463.53mn and 48.31mn respectively.

Tab.3: rates of diurnal activities of Shelduck breeding female during the laying and incubating period.

Activities	Laying period (%)	Incubating period (%)
Feeding	28.89	18.04
Incubation	64.63	78.13
Preening	6.71	3.81

The female in the laying period carries out a few visits per days to the feeding territory. The average time spent in feeding in this period is equal to 30.12 ± 2.2mn, rang: (27 - 33mn), n = 8, and equals to 68 ± 3.42mn, rang: (62 - 72mn), n = 8 for the incubation and 7 ± 1.5mn, rang: (5 - 9mn), n = 8 for the preening (tab. 4). During the incubation period the female became much more attached to the nest. The male was often observed alone in the feeding territory except for a short period during the female visit. In the incubation period the female makes 2 - 3 visits per day to the territory and each visit lasts an average of 30mn.

Tab. 4: mean time spent for each activity during the laying and incubating period.

Activities	Laying period (mn)				Incubation period (mn)			
	Min	Max	Mean	N	Min	Max	Mean	N
Feeding	27	33	30.12 ± 2.2	8	20	35	27.6±3.55	25
Incubation	62	72	68 ± 3.42	8	65	162	108±24.57	27
Preening	5	9	7 ± 1.5	8	3	10	5.84±1.93	26

During the incubation period the mean time spent by the Shelduck female in feeding, in each visit to the feeding territory, is equal to 27.6 ± 3.55mn, rang: (20 - 35), n = 25, equal to 108 ± 24.57mn, rang: (65 – 162), n = 27 for incubation and 5.84 ± 1.93mn, rang: (3 - 10mn), n=26 for preening. Seasonal changes were observed in the time allocated to each activity during the laying and incubation period. Fig. 1 shows a decrease in feeding period during the incubation period.

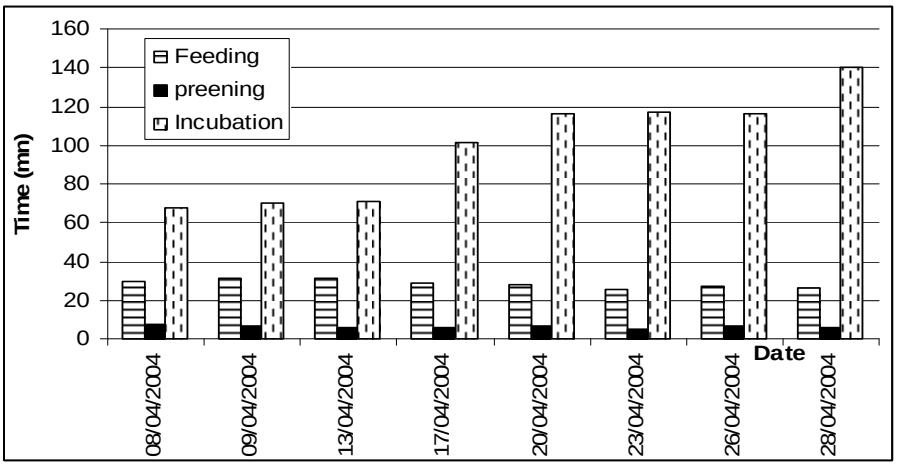

Fig 1: Evolution of diurnal activities during the breeding period.

The incubation which lasts approximately 65mn during the laying period increases during the incubation period , especially in the last days of incubation, while the preening remains practically constant during all the breeding period (between 3-10mn).

The activities of the female on the nest has not been studied, presumably because the nest's inaccessibility. Our observation on the territorial male shows that there is a behavioural change between two distinguishes periods: the period where the male is alone on the territory and the period where the male and the female were together on the territory.

During the first period, the male dominant activity is resting and sleeping. It feeds 2 or 3 times a day, 30 mn each time. We have never observed the male feeding when the female is present on the territory. From time to time the male becomes alert and it rarely leaves the feeding territory except accompanied with the female to the burrow.

During the incubating period, we have observed that the Shelduck male came to the nest burrow and called her mate with a clear strong whistle. The female joint quickly the male and return to the feeding territory. Sometimes the female returns alone to the territory calling repeatedly on her way and the male flies to meet her.

The female starts directly feeding and the male follows her often in parade. The feeding period lasts between 20-35mn. The preening always takes place after feeding period with a average time between 3-10mn. The male appears always to accompany the female back to the nest.

DISCUSSION

The study of diurnal time budget of a female Shelduck during the different breeding phases shows that the female spends enough time in incubation and make only a small number of visits to the feeding territory. During laying period, the female is typically absent from the territory for a single short period each day. During the female stay is the nest, the male returns alone to the territory [11,12]. It was found that in the laying period, females spend more than 70 % and 14 % of their time on feeding territory in the laying and incubation periods respectively [13].

Wiliams found that the females were absent for about 2 hours from feeding territory [14]. This suggests that laying females spend some time in the nesting area before or after laying. This may enable them to make sure they were not observed by predators or other shelducks in the nest.

During the short visit to the territory, the females spent most of their time in feeding, with a short time in preening before returning to the nest. During incubation period, it was found that the female is especially absent from the territory, and spends approximately 80-90 % of its time when visiting the territory in feeding [11,14,15].

The Time spent in the nest by the Shelduck female was measured in an automatic recording at the nest [15]. It was found that throughout 24 hours, the female stays always in the nest from 18h to 4h. Our results should be interpreted with caution, as disturbance can affect directly the time spent by the species in feeding.

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