

# Daily activity of Stone Curlew *Burhinus oedicnemus* during the breeding period

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Daytime activity budgets for six pairs of breeding Stone Curlew *Burhinus oedicnemus* in a desert of the south-eastern Caspian coast, Turkmenistan, are compared for different periods throughout the breeding season. In the pre-breeding period, males spend about 2.5 times more time foraging than females, as they partly feed the females during mating; males also spend more time than the females in nest-building. The birds start incubating from the first egg; both sexes incubate, although in the early stages males incubate for twice as much time as the female, later on the time spent incubating equalises and sometimes the female even incubates for longer than the male. The time devoted to foraging gradually decreases. The bird not involved in incubating or feeding, spends time roosting or preening. The chick is guarded alternatively by both mates, so that it does not remain alone until it is 14 days old. Foraging activity at this time again increases, the male being more active in feeding chicks than the female. Normally, all the activity takes place within a 2-4 ha breeding territory.

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Приводится сравнение бюджетов дневной активности для шести пар авдоток *Burhinus oedicnemus* в пустыне на юго-восточном побережье Каспийского моря (Туркменистан) для разных периодов в течение гнездового сезона. В предгнездовой период самцы затрачивают приблизительно в 2.5 раза больше времени на кормодобывание, чем самки, так как самцы частично подкармливают самок во время образования пары; также, самцы тратят больше времени, чем самки на гнездостроение. Насиживание начинается после откладки первого яйца; насиживают оба пола, хотя на ранних этапах самцы насиживают вдвое больше, чем самки; затем доля участия партнеров в насиживании выравнивается, а в некоторых случаях самка проводит больше времени на гнезде, чем самец. Посвященное кормодобыванию время постепенно сокращается. Птица, не принимающая участия в насиживании или кормлении, отдыхает или чистит оперение. Оба партнера поочередно охраняют птенца, так что он не остается один до четырнадцатидневного возраста. В это время кормодобывательная активность увеличивается, при этом в кормлении птенцов самец более активен, чем самка. Как правило, вся активность проходит в пределах гнездовой территории площадью 2-4 га.

## Introduction and Methods

The Stone Curlew *Burhinus oedicnemus harterti* demonstrates very shy behaviour and belongs to the group of waders that have been rather poorly studied. This is especially the case concerning the Stone Curlew's behaviour during the breeding period. Special studies on the behaviour of Stone Curlews were made in 1978, 1979, 1982 and 1989 in the lower reaches of the Atrek river at the south-eastern coast of the Caspian Sea (37°25'N 54°25'E). Observations of different types of breeding activities, were made from hides (15 m towers) with the use of binoculars (x7, x12) and a telescope (x30). These observations were facilitated by the fact that

the birds nested in sites with low grass cover. Usually observations were made at large distances (30-150 m) in order to minimise the disturbance to the birds. One pair was observed during mating and nest-building (in total for 825 minutes), four pairs during incubation (for 4,112 minutes), and the activity of one brood was examined in total for 1,455 minutes.

## Results and Discussion

### Pre-breeding period

Stone Curlew are crepuscular (Brehm 1894; Rustamov 1954). The results of our observations are

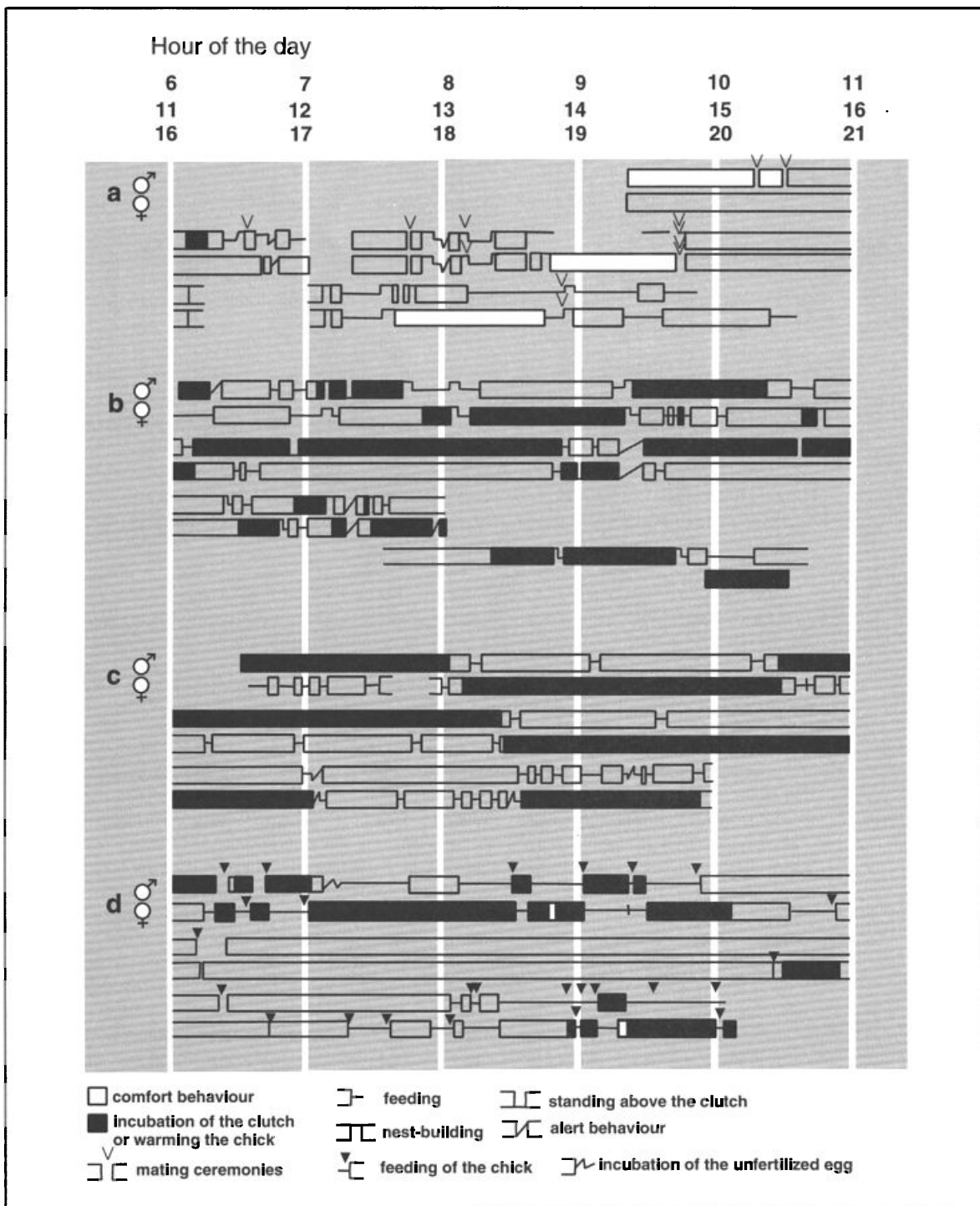


Figure 1. Characteristics of Stone Curlew behaviour: a - in the mating period (8 May 1979, 12.20-16.05; 9 May 1979, 09.20-12.00, 17.00-20.30); b - after laying of the first egg (26 May 1989, 06.05-18.00; 25 May 1989, 17.30-20.30); c - in the middle of incubation (11 June 1989, 06.30-19.52); d - with the brood (7 June 1979, 06.00-20.00). Horizontal axis is hour of the day. In each pair of bars, the upper indicates the behaviour of the male, the lower that of the female at the time of day indicated by the horizontal axis.

presented in Figure 1. Birds spent most day-light hours on comfort behaviour (roosting, rest, and preening). On cold spring days (for example on 8-9 May 1979 which was cloudy and sometimes rainy and when the temperature was 15.5°- 20°C in the shade) they stand for a long time sheltering from the wind behind low shrubs. On hot sunny days (25°- 35°C with mild wind and much sun) they stand or lie down in the shade of these shrubs.

During the mating period this roosting/comfort behaviour, (which is difficult to distinguish), occupied 59.1% of the male time budget, and 82.9% of the female.

Feeding activity mainly occurred in the evening (Figure 1a). The male spent two and a half times as much time foraging (27.6%) as the female (11.3%). This is because during the mating period the male brings part of its prey to the female in a feeding

ceremony. Such prey items are mostly large insects of Gryllotalpidae, Coleoptera and Acridoidea.

Both mates nest-build, although the male spends comparatively more time (11.0%) on this activity than the female (4.5%). Other behaviours occupied not more than 2.5% of time.

### Laying and incubation period

Even during the nest-building period, short-term incubation of empty nests was observed. According to many studies, incubation starts after the second egg is laid (Niethammer 1942, cited from Gladkov 1951; Makatsch 1974), or immediately before the laying of the second egg (Cramp & Simmons 1983). During our observations, birds started to incubate after laying the first egg (in two cases). The day after laying the first egg, the birds spent a lot of time incubating (Figure 1b). Both birds incubate, although the major role in the first days is taken by the male, who spends 53.2% of his time on the nest, while the female spends only 25.6% of her time. In this short period incubation is not tight: birds often exchange incubation duties, sometimes standing above the nest for one to four minutes, indeed the nest was not incubated at all for 21.2% of observation time. Most often it was left by birds in the morning. The reason for this is probably that leaving the nest for long during the sunny middle of the day might result in overheating of the clutch and thus egg mortality. This probably also explains why incubation starts with the first, but not the second egg.

After the first egg is laid, Stone Curlews continue with nest-building: the male spends 1.8% of his time on this behaviour, the female 1.1% of her time, although in this period the behaviour connected with nest-building is in the context of the exchange of incubating partners at the nest. Comfort behaviour still occupies a lot of time both in the male and female (respectively 31.5% and 58.7%). For the major part of this activity, the female stood in a plain posture or laid in the shrub-shadow. She spent 15.3% of time preening (male 16.2%). Compared to the mating period the male spent less time feeding (11.2%). No such differences were found for the female, and she still spent a lot of time foraging (10.3%). These observations, as well as the differences in behaviour of mates during incubation, would seem to relate to the greater energetic requirements of females during egg-laying.

After the second egg is laid, incubation becomes more tight. A fresh clutch of two eggs was incubated by birds for 91.2% of time (60.8% by male and 30.4% by female). By the middle of the incubation period the time spent on this activity increased even more (Figure 1c). On the 18th day after the first egg was laid, the clutch was incubated for 98.5% of the observation period, and the nest was left only for 12 minutes (1.5%). This time, partners shared incubation almost equally: the male was on the nest for 44.9% of time, the female for

53.6%. Very similar data (48.4% and 49.5% respectively) on the participation of mates in incubation were obtained by Kovshar & Berezovikov (1992). In the other case (7 June 1978; c. 14-16th day of incubation) the clutch was incubated for 95.8% of time, and left by birds for 35 minutes in total (4.2%). At this nest, the female spent more time incubating (61.1%) than the male (35.1%). In the latter case the males lesser incubation activity was connected with his more pronounced alert behaviour: of four cases of disturbance (passing motor-cycles) three occurred when the male was on the nest. Together with the increased tightness of incubation, the period between exchange of partners on the nest was also larger (Figure 1).

As the time spent by the female on incubation increased, the proportion devoted to comfort behaviour became respectively smaller (19.5% - preening, 15.6% - roosting and comfort movements). Simultaneously, comfort activity increased in the male to up to 49.3% of the time (25.6% and 23.7% respectively for preening and roosting). At the second nest the male spent 52.4% of time on comfort behaviour and the female 27.3%.

In the middle of incubation, the time spent feeding during the day also reduces: in one case the male was foraging for 33 minutes (4.1%), the female for 52 minutes (6.5%), and at the second nest; respectively 41 and 43 minutes (4.9% and 5.1%). This decline in the feeding activity probably indicates that the energy requirements during incubation are rather low and can be compared with those necessary for comfort behaviour. This is also indicated by the fact, that although the role of the partners in incubation differs, they spent an almost equal amount of time foraging, although this is dependent on their being no major differences in night-time activities.

### Chick-rearing period

The rhythm of activity changes with the appearance of chicks (Figure 1d). One of the pair always stays with the chicks, while the other is foraging for itself. The task of the first bird is to protect and to warm the chicks. The only chick in the observed brood was never left alone until the age of 14 days. The adult bird that was nearby, spent most of the time preening or roosting, therefore this behaviour is also called comfort in Figure 1d. When the chick was three days old, the male spent 73.5% of time (617 minutes) with it, and the female spent 83.4% of time (701 minutes). Both birds guarded the chick for 49.6% of observation time. In the morning hours adults were warming the chick: the male for 99 minutes (11.8%), and the female for 243 minutes (28.9%). The female in the studied pair, was more attached to the chick. During the hottest midday hours the chick sometimes hid below the adult to avoid overheating. Comparatively more time was spent warming the chicks (67.5-99.3%) by Stone Curlews in Kazakhstan (Kovshar & Berezovikov 1992), although the observations discussed in the

latter paper were very limited (only three and a half hours in one case and two hours in another, and only during rather cold morning hours).

Compared to the incubation period, the feeding activity of both pair-members increases after hatching. The male spent much more time foraging (25.8%) than the female (16.9%), and more often brought prey items to the chick (on 7 June, 15 food deliveries were made by the male and 14 by the female, on 6 June 1979 there were respectively six and one deliveries). From 29 deliveries the chick ate 26 and rejected three. When the chick was one to two weeks old, he acquired food almost equally from the male and female (respectively 12 and 13 food items observed), although the male continued to spend more time on foraging compared to the female (respectively 199 and 50 minutes). Rather often the chick was fed by the guarding bird, which pecked insects passing nearby. As in the other stages of breeding, most feeding activity was observed in the evening and morning hours.

### Movements

During the daylight Stone Curlews move very little. Usually, they do not leave the breeding territory, which is normally about two to four hectares in size. Only in one case, when the breeding territory was very small (less than 1 ha) and surrounded by dense high shrubs, in the evening the male flew to a nearby open area c. 250 m distant. Movements in general are related to foraging although in the mating period they also include movements related to mating ceremonies and nest-building. During incubation there are also comfort related

movements, e.g. to the shade of shrubs, the exchange of birds at the nest, and movements as a result of disturbance. All these movements not connected with foraging are trivial both in space and in time. For example, during incubation they take only five to six minutes, i.e. less than 0.8% of the total observation time.

We consider that the above data on Stone Curlew time budgets explains that the inconspicuous nature of this bird is connected not only with plumage colour, but also with very low activity during daylight hours. The low feeding activity (up to 4.1-6.5% during incubation) is most surprising. Therefore, judging by the type of activity Stone Curlew can be compared with typical nocturnal birds.

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