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Breeding of the Tropical Screech Owl, *Otus choliba* in Talparo, Trinidad and Tobago

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ABSTRACT

Between 1988 and 1995, a pair of *Otus choliba* attempted to breed beneath the eaves of my home near Talparo, Trinidad. Eggs were laid and incubated, but only in 1995 was incubation successful when two chicks hatched after an incubation period of 26 days. The chicks flew at about 30 days old. Observations were made on the frequency of visits by the male to the incubating female, the times when the female vacated the nest and the progress of the chicks as they grew. In all aspects studied here *Otus choliba* conforms neatly with its congeners in North America.

INTRODUCTION

Compared with what is known about breeding in North American species of *Otus* (Gehlbach 1995; McCallum 1994; Terres 1982) the information available about breeding in *Otus choliba* in Trinidad (ffrench 1991) is minuscule. ffrench (1991) states merely that the breeding season is February-May, the nest is usually a hole in a tree, and clutch size is 1-3 white eggs that average 33.8 x 29.1 mm. The following observations add to this short list.

STUDY SITE

My home off Leotaud Trace, Talparo, Trinidad is a prefabricated house of greenheart timber. There is no continuous ceiling under the eaves, but at each corner a partial ceiling serves as a base for a security light. Thus, at each corner there is a shallow, rectangular cavity about 85x60x15 cm with a gently sloping floor and one side open towards the central ridge of the roof. Two of these, at the SE and SW corners attracted the attention of a pair of *Otus choliba* during the dry season in 1988 and subsequent years.

The cavities are slightly over three metres above ground level, but by standing on the nearby windowsill, I could easily see inside the cavities. The room at the SW corner of the house is my study where I spend most of my time and sitting at my desk at night I could easily hear in the stillness of night-time in the countryside footsteps of the owls as they came and went, the rolling of the eggs as the female moved them, the soft calls of the owls to one another and the sounds made by the chicks when they eventually hatched.

OBSERVATIONS

1988

The owls first appeared at the beginning of February, 1988 and by 30 April settled on the SW cavity as their nesting site. In the morning of 1 May an owl, which I identified as a female (Perrins and Middleton 1985), was sitting there and in the evening was seen there three more times. At 1831 hours on 2 May there was one egg in the nest, and between 1835 on 3 May and 2400 on 6 May a second egg was laid. The eggs were incubated until 31 May, but failed to hatch. During this period I watched the pair as often as possible and recorded what I saw of their behaviour.

In the evenings, the male would arrive, perch in a nearby tree and call. Usually the female would fly from the nest at his call, spend some minutes with him and then return to the nest. Both outside and within the nest cavity the birds called to each other with a quick series of hoots, about 2-10 in number, each series lasting 0.5-1.0 seconds in a softer and lower version of the usual call without the terminal accented hoot. Less often, soon after the male called he would join the female in the cavity. After a few seconds, he would fly out again with the female following him. I have only one record of the time spent together off the nest for the year 1988 – 9 minutes. For 1989 I have three: 13, 12 and 5 minutes. The mean for all four is 9.75 minutes. The female left the nest later in the night too. I have six such records, one for the period 2000-2100 , two for 2200-23:00 and three for 0000-0100.

Table 1 gives times for the evening vacation of the nest in relation to sunset for the period of incubation. As the sunset got later, so did the time of departure. (Table 1). The correlation coefficient is r=0.95. (P=0.001 by Student's t test). The duration of the waiting period, i.e. the time between sunset and the departure from the nest (column 4, Table 1) is highly correlated with the duration of incubation (column 1, Table 1), r =0.86, p = 0.2, by Student's t test.

Table 1. Female's vacation of the nest in relation to time of sunset in May, 1988.

Date	Time of departure	Time of sunset	Diff. minutes col. 2 – col. 3
2.5.88	1831	1817	14
3.5.88	1836	1817	19
8.5.88	1844	1818	26
10.5.88	1837	1818	19
11.5.88	1838	1818	20
15.5.88	1846	1819	27
31.5.88	1915	1824	51

1989

A pair of owls appeared again in 1989 on 13 March and by the morning of 15 March the female was in the nest cavity seemingly incubating the eggs from the previous year (???). Incubation came to an end on 4 April after 32 days. Table 2 gives a record of visits by the male to the nest on the eight days when observations were made. The period of observation was 2000-2300, except for 3 April when observation ceased at 2200, and twice (9 and 14 April) when the period was 0000-0100. The mean time between visits was 32.9 minutes. Ten visits (43 %) occurred in the period 2000-2100, more than any other one hour period before midnight, but in terms of visits per hour of observation, more occurred in the hour after midnight than any other hour.

Table 2. Visits by the male *O. choliba* to the female in the nest in 1989.

Date	Time of visit	Interval between visits (minutes)
21.3.89	2055	
	2106	11
	2148	42
	2208	20
23.3.89	2010	
	2035	25
	2100	25
	2250	110
30.3.89	2024	
	2055	31
2.4.89	2024	
	2043	19
	2051	8
3.4.89	2100	
	2131	31
9.4.89	0005	(3 visits in 23 minutes)
	0028	
10.4.89	2020	
	2025	5
	2130	65
14.4.89	0020	
	0030	10

1993

In 1993 one egg was laid and abandoned after a few days. As the site could have been too draughty and prevented the eggs reaching the right temperature for incubation, I insulated it with paper and Styrofoam, and reduced the size of the cavity about half.

1994

When the owls came back on 5 March 1994, I tore up a brown paper bag into small pieces about 15 x 10 cm and pushed them into the lower end of the cavity. The owls did not remove them. Two eggs were laid between the 20 April and 25 April (while I was absent). They were incubated until 24 May and then abandoned.

1995

The owls came back in 1995 and I made another attempt to provide better insulation. I also made sure that there were no old eggs in the nesting cavity. In the morning of 13 March the female was back in the cavity, and was there that night and the next day. There was no egg at 1840 on 16 March, but about 2330 on 18 March I heard sounds as though an egg was being moved. At 1830 on 19 March there was still only one egg in the cavity, but two eggs were there at 2000 on 20 March. No more eggs were laid and the owls were continually in attendance at the site thereafter.

Two eggs were still present in the cavity at 1830 on 12 April. No check could be made on 13 April, but on 14 April at 0815 light "squeaky-chirpy" sounds were coming from the cavity. A check at 0915 h revealed the female and some broken egg shell. At 1000 the next day a large piece of eggshell (more than half) was evident, and at 2320 there were two large pieces of eggshell.

During the next four weeks there was always a period of some minutes between 1830 and 1930 when both birds were away from the cavity, and I examined the site nearly every day at that time to note the progress of the chicks. I saw both chicks for the first time on 17 April. They were a little smaller than the chicks of a domestic fowl, one slightly larger than the other, and both covered in white down. Their eyes were closed and they made the "squeaky-chirpy" sounds I had heard earlier. Their eyes did not seem to be both directed forward as in adult owls, but on each side of the head as in chicks of the domestic fowl. For this reason they did not look like owls.

By 26 April, 17 days after the hatching of the first chick, they were looking much more like owls, with the eyes directed forwards but still closed. On 27 April the larger chick seemed to have its eyes open, but covered by a nictitating membrane. On 30 April the eyes of both chicks were wide open. On 2 May the larger chick was a very pale grey and finely barred with darker grey. The illustration of immature *Otus asio* in Terres (1982) gives a good idea of their appearance at this stage. On 4 May I noticed that the irises were yellow. On 7 May there was still no hint of brown, but by 12 May the plumage was distinctly brownish, and the wing feathers were well grown and patterned in brown and tan. This was well seen when the older chick spread its wings, lowered its head swayed from side to side and repeatedly made loud snapping sounds with its bill in a typical threat display. On 6 May the adult female had made a similar display when I looked into the cavity. On 14 May at 0800 both chicks were present, but by 2330 one had flown and the other was standing at the edge of the cavity seemingly ready to fly too. By 0800 on 15 May the second chick had flown.

In subsequent years the site deteriorated and the owls did not come back after 1995.

DISCUSSION

My notes for the first four years are not complete enough to fix the number of days that the female occupied the nest before laying the first egg. The period may have been as short as 24 hours. In 1995, however, she occupied the nest for five days before laying the first egg. This preliminary occupancy seems to be typical of owls in the family Strigidae (Perrins and Middleton 1985) and *Otus asio* is known to occupy the nest for six days prior to laying (Gehlbach 1995). During this period and during the succeeding period of incubation the male feeds the female. This is true of *Otus choliba* as well.

My observations were not frequent enough to fix the exact time the eggs were laid. This makes calculating the duration of incubation difficult. Most diurnal birds lay near sunrise at the start of their period of activity (Welty 1975; Terres 1982), but much less is known about nocturnal birds. The pauraque *Nyctidromus albicollis* lays near sunset at the start of its period of activity (Terres 1982; pers. obs.), and I shall assume that owls do too.

In 1995 the first egg was laid between 1840 on 16 March and 2330 on 18 March. I feel confident that if the first egg had been laid in the evening of either 16 or 17 March I should have heard it being moved much earlier than 2330 on the 18 March. Therefore, I place the laying of the first egg in the evening (about 1800) of 18 March. Owls are known to lay the second egg 38-48 h after the first (Welty 1975), though some lay on successive days as does *O. asio* (Gehlbach 1995). Therefore, I place the laying of the second egg in the evening of 20 March (before 2000) and not on 19 March

after 1830. *O. asio* lays its first 2-3 eggs on successive days (Gehlbach 1995); *O. flammeolus* lays three eggs, the first two on successive days and the third after two more days. If my argument is accepted, *O. choliba* lays the second egg two days after the first. The observations of 1988 also indicate a gap of two days between the two eggs. I assume that incubation began after the laying of the first egg because of the difference in size between the two chicks and the difference in hatching dates. In *O. asio* 63% of females incubated immediately and 25% began with the laying of the second egg (Gehlbach 1995). In *O. flammeolus* incubation begins one night before the third egg is laid (McCallum 1994). The first chick hatched between 1830 on 12 April and 0815 on 14 April. I could find no information at all about the time of hatching of nocturnal birds, but the pauraque hatches in the evening (pers. obs.), so I shall assume that owls do too. Therefore, the choice lies between the evening of 12 April (after 1830) or the evening of 13 April. I feel confident that I would have heard "squeaky chirpy" sounds long before 0815 on 14 April if hatching had occurred on 12 April, so I assign the hatching of the first chick to 13 April, 26 days from 18 March. The second chick hatched between 1000 and 2330 on 15 April, most probably in the evening, 26 days from 20 March. If my assumptions are wrong, incubation can be given no more accurately than 25-29 days for both chicks. In *O.asio hasbrouckii* the maximum period of incubation for the first egg is 34 days; the minimum for the others is 27 days, the actual value depending on environmental conditions (Gehlbach 1995). In *O. asio asio* incubation "is often given as 26 days …apparently following Sherman (1911)," (Gehlbach 1995). In *O. flammeolus* eggs require 22 to 24 days incubation depending on locality (McCallum 1994).

The first chick to hatch flew in the evening of 14 May, and the second by early the following morning. Thus, the first chick flew after 31 days and the second at 29-30 days. The plumage passed from white down to the finely barred appearance of the adult in about 19 days, and brown appeared in the generally grey colour at 26-27 days from hatching. The movement of the eyes from a lateral to a more forwardly directed position came after about 13 days. I have found no mention of this in the literature.

The two outstanding stage-markers in the continuous process of development of young birds are the opening of the eyes and the eruption of the vanes from the quills of the primary feathers. Table 3 compares my observations on *O. choliba* with others on some of its congeners. From the scanty data, it seems that *O. choliba* is slower in development than the other species and closest to *O. flammeus.* It is noteworthy that of the three other species, this last has the widest distribution and "lives on every continent except Australia" (Terres 1982), including South America.

I paid little attention to the behaviour of the parents after the chicks hatched but my impression was that the female spent most of her time in the cavity where she was fed by the male. On 10 May, 27 days after the first chick hatched, she was not in the cavity at 0730, and might have spent the rest of the daylight hours away from the chicks. She was present at 0830 on 11 May, and absent again at 0830 on 13 and 14 May, so nearing full fledging the female may leave the chicks unattended during the daytime.

The observations of 1988 (Table 1) showed that the female became more and more reluctant to leave the nest as hatching approached. This seems to be true for all species (Terres 1982) and may be a behavioural adaption to increase the chance of a favourable outcome to incubation. "Recess time decreases as incubation progresses" in *O. asio* (Gehlbach 1995), and this may be true of *O. choliba* as well.

O. choliba has the smallest clutch size of the *Otus* species considered here (Table 3). This is consistent with the "egg rule" that tropical birds have smaller clutches than similar birds in temperate countries (Terres 1982).

Table 3. A comparison of *O. choliba* with some congeners.

Feature	*O. choliba*	*O.asio* [a]	*O. flammeolus* [b]	*O. flammeus* [c]
Eyes open*	16-17 (1)+ 14-15 (2)++	7-9		8-12
Primaries erupt*	26	13-15		
Fledging*	31 (1) 29-30 (2)	28	25	31-36
Clutch size	1-2	2-8	2-4	4-14

* Days from hatching: +(1) = chick 1; ++(2) = chick 2.
a. Gehlbach 1995; b. McCallum 1994; c. Terres 1982.

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