

# Breeding Data on Chestnut Weavers in the Etosha National Park, South West Africa/Namibia.

by

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## CONTENTS

Introduction .....	157
Study Area and Methods .....	157
Results .....	158
Discussion .....	161
References .....	161

## 1 INTRODUCTION

The Chestnut Weaver *Ploceus rubiginosus* is a poorly known species, which migrates southward to breed as far south as Windhoek (Maclean, 1985). To date, however, its breeding cycle has not been studied in detail. Its appearance and disappearance are erratic, but may be linked to the equally unpredictable rainfall of this region. Furthermore, the species may remain in South West Africa/Namibia throughout the year, especially after good growth of grass, as we collected both sexes of Chestnut Weaver near Ombika waterhole in August 1986 at the height of the dry season. In 1985/86 an average precipitation of 497 mm was measured in 11 rainmeters (Nott, Stander and Dent, 1986) situated in the area where Chestnut Weavers nested on a large scale. This is higher than the calculated average rainfall of 420 mm for Okaukuejo, 30 km away. The resultant grass production and insect proliferation were followed by nest building in the Chestnut Weaver. We recorded egg laying, incubation and nestling periods, together with observations on breeding behaviour of the Chestnut Weaver.

## 2 STUDY AREA AND METHODS

- 2.1 We selected 2 different vegetation types where the weavers bred preferentially: mopane *Colophospermum mopane* woodland and thornveld savanna characterized by *Acacia mellifera*, *A. nebrownii* and *Albizia anthelmintica*. The breeding sites were adjacent to each other and situated up to 30 km northwest of Okaukuejo restcamp, near Sprokieswoud and Leeubron-Adamax waterholes (19° 00'S, 15° 45'E). Several thousand nests were built in this area.
- 2.2 From 14 March to 24 April 1986 colonies were visited at intervals of 1-2 days. Bushes and trees which had nests were selected at random and individual nests were marked. Eggs were indelibly numbered as laying progressed, and nestlings weighed to the nearest gram, using a Pesola spring balance. After hatching was complete, unhatched eggs were collected, weighed to the nearest 0,1 g and measured to the nearest 0,1 mm. When the young had left the nest, a sample of nests was col-

## ABSTRACT:

Chestnut Weavers nested in Etosha during 1986 following good rains, allowing data to be collected for the first time on egg laying, incubation, chick growth and nestling period. Mean clutch size was 3,2 eggs (n=53). The incubation period was 11-14 days. Hatching success was 52% and nestlings left the nest after 13-16 days. Incubation and feeding of chicks appear to be done exclusively by females.



Chestnut Weaver males building and advertising nesting sites.



A Chestnut Weaver male in full breeding plumage sits above completed nests.

lected, weighed, measured and the major grasses used in their construction identified. We also made observations on food items, presence of males, other bird species and disturbance at the breeding colonies by ourselves. Photographs of aspects of the breeding cycle were taken.

### 3 RESULTS

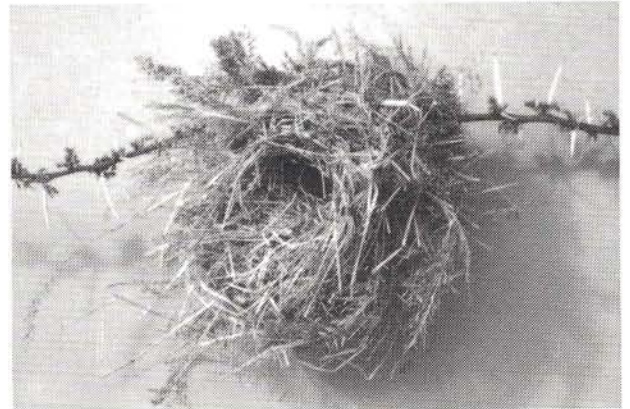
#### 3.1 Bush and tree selection and nest-building

In early March we noticed flocking and loud chat-

tering by male Chestnut Weavers in breeding plumage. This was soon followed by building of preliminary nest rings which were used by the males as roosting perches. These initial attempts were abandoned. By mid-March, however, flocks of males were building and intensively advertising their nesting sites to females in typical weaver fashion, *vide* Masked Weaver *P. velatus* (Maclean, 1985). Nests were built quickly of green grasses, and within a week of first seeing birds in breeding plumage we recorded the first eggs (14 March). Nests were built mainly in mopane, *Acacia* and *Albizia* trees and bushes. Contrary to our expectations, nests built in the multi-stemmed, willowy *A. nebrownii* bushes proved as successful as those in sturdier trees. Several trees in the area held large numbers of Masked and Chestnut Weaver nests in community. A count of the most densely occupied tree showed 94 Masked Weaver nests and 45 Chestnut Weaver nests, the two species apparently tolerant of breeding in close proximity.

#### 3.2 Nests and nesting material

Nest dimensions and masses are shown in Table 1. The method of measuring the nests *in situ* is shown in Figure 1.



Completed Chestnut Weaver nest with typical untidy appearance.



*Acacia nebrownii* bushes provided unlikely nesting sites for Chestnut Weavers.

TABLE 1: External dimensions and masses of 26 Chestnut Weaver nests from Etosha National Park (1986).

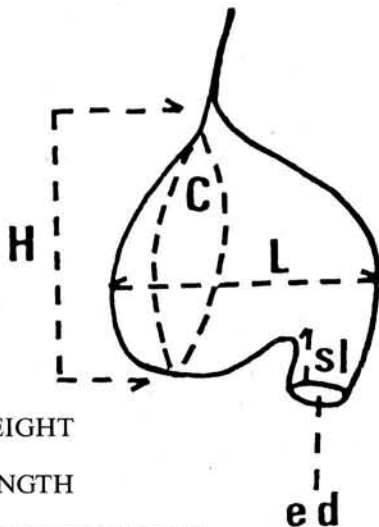
Dimensions (cm)										Mass (g)	
Length		Height		Circumference		Spout Length		Entrance Diameter		Mean	Range
Mean	Range	Mean	Range	Mean	Range	Mean	Range	Mean	Range		
16	15-21	15	12-18	47	44-51	6	3-10	4	3-5	66	43-96

Ten used nests which were dismantled were attached to the branch tips by strongly woven grass stems. Unlike the Masked Weavers, the Chestnut Weavers did not strip the branches clean of foliage near the nest's attachment point but incorporated surrounding foliage into the nest structure. The manner of weaving was such that the exterior of a nest had a ragged appearance with stems and blades of grass jutting out untidily. However, the impression of a loose, weak nest structure was false and the interior was of tightly woven inflorescences. The predominant grasses used in nest construction were: *Eragrostis annulata*, *E. glandulosipedata*, *E. porosa*, *Enneapogon brachystachyus*, *E. cenchroides*, *Stipagrostis* spp., *Tragus* spp. and *Aristida* spp. Since these grass species were abundant in the study area, it appears that there was no selection of nesting material.

Empty or abandoned nests were utilised by Red-headed Finches *Amadina erythrocephala* which laid eggs (Archibald, 1987).

### 3.3 Egg laying and incubation

A total of 172 eggs were recorded in the 70 nests examined, although the net number of nests con-



H = HEIGHT

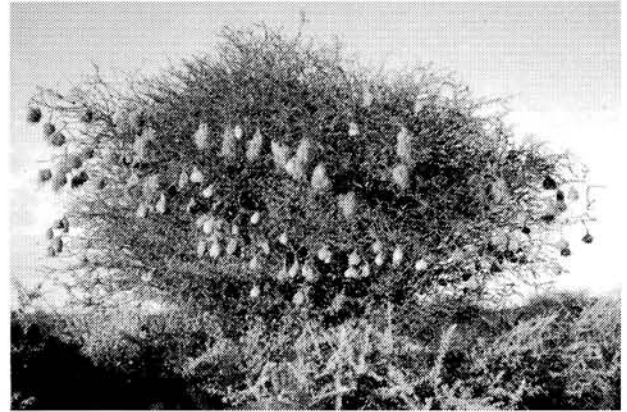
L = LENGTH

C = CIRCUMFERENCE

sl = SPOUT LENGTH

ed = ENTRANCE DIAMETER

FIGURE 1: Key to the measurements made of Chestnut Weaver nests (Table 1).



The neat nests of Masked Weavers contrasted strongly to the ragged nests of Chestnut Weavers.

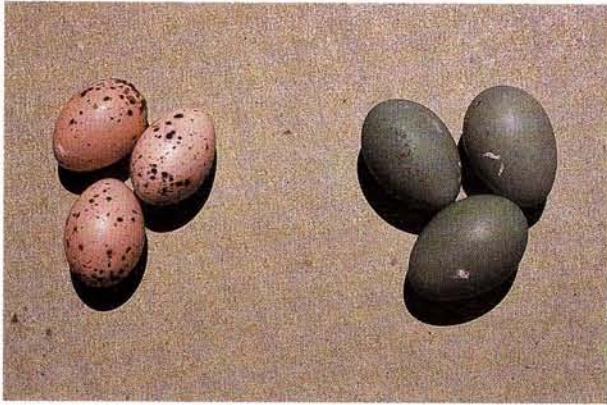
TABLE 2: Clutch size, laying interval and incubation period of Chestnut Weavers in Etosha National Park (1986).

No. of nests examined	No. of eggs per clutch	Total no. of eggs	Laying period (days)	Incubation period (days)
17	empty	-	-	-
2	1	2	1	?
5	2	10	2	11-12
31	3	93	3-4	11-14
9	4	36	3-4	11-14
5	5	25	4-5	?
1	6	6	5-6	?
Total 70	$\bar{x} = 3,2$	Total 172	-	-

? = eggs broken or disappeared

taining eggs was 53 (Table 2). Mean clutch size was 3,2 eggs, with a range of 1-6 eggs, laid at intervals of about 24 hours.

Out of 172 eggs, 54 were broken or disappeared during incubation, while 29 did not hatch. This resulted in a hatching success of 52% (89 chicks). Nests which held only 1-2 eggs were mostly abandoned before completion of laying. Clutches of 5-6 eggs may have been produced by more than one female. Neither of these extremes was successful and only nests with 2-4 eggs produced chicks. Incubation was 11-14 days (Table 2). Eggs which were laid first had the shortest incubation period, whereas the last-laid eggs showed the longest incubation, possibly because brooding of remaining eggs was interrupted when females began foraging for the first hatchlings. Egg colour was uniformly turquoise-blue; egg measurements are shown in Table 3.



Speckled eggs of Masked Weavers compared to the uniform, turquoise-blue eggs of Chestnut Weavers.



Chestnut Weaver nestling aged 14 days, at period of nest departure.



Newly-hatched Chestnut Weaver (Day 1) next to an egg due to hatch within 24 hours.



Four Chestnut Weaver nestlings aged 1-4 days, showing the asynchronous hatching.

TABLE 3: Dimensions and masses of Chestnut Weaver eggs collected in Etosha National Park (1986).

Dimensions (mm) n=155		Mass (g) n=27	
Mean	Range	Mean	Range
22,2 × 15,7	(20,3 – 24,5) × 14,1 × 17,2)	2,6	(2,0 × 3,1

These dimensions agree closely with those given in Maclean (1985): 22,5 × 15,7 (20,4 – 24,5) × (14,5 – 16,8).

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### 3.4 Nestling period and gain in body mass

Chicks flew 13-16 days after hatching and, as in the case of incubation, the first hatchlings in a brood had the shortest nestling period. We ascribe this to the demand for food made by the whole brood on the female, which resulted in a more protracted feeding period for younger chicks. A hatching chick had a body mass, measured on an electronic, digital scale, of 2,06 g. Growth was rapid, chicks increasing their body mass daily by 70 % during the 3 days following hatching (Figure 2). This declined progressively and on Day 9 a 5% decrease in mean body mass was measured, possibly attributable to accelerated feather production (Figure 2). The slight (2%) decline in body mass on Days 13 and 15 was probably the result of increased activity associated with nest departure. The most evident predator during the breeding cycle was the Black Crow *Corvus capensis* which robbed nests of eggs and chicks. Although raptor species frequented the nesting colonies, no predation was observed.

### 3.5 Parental care and development of young

We saw males present in trees where chicks had hatched but did not record them carrying food to the nest. A male was observed in one marked nest and an inspection revealed that the 3 eggs it had contained were broken. Incubation and feeding

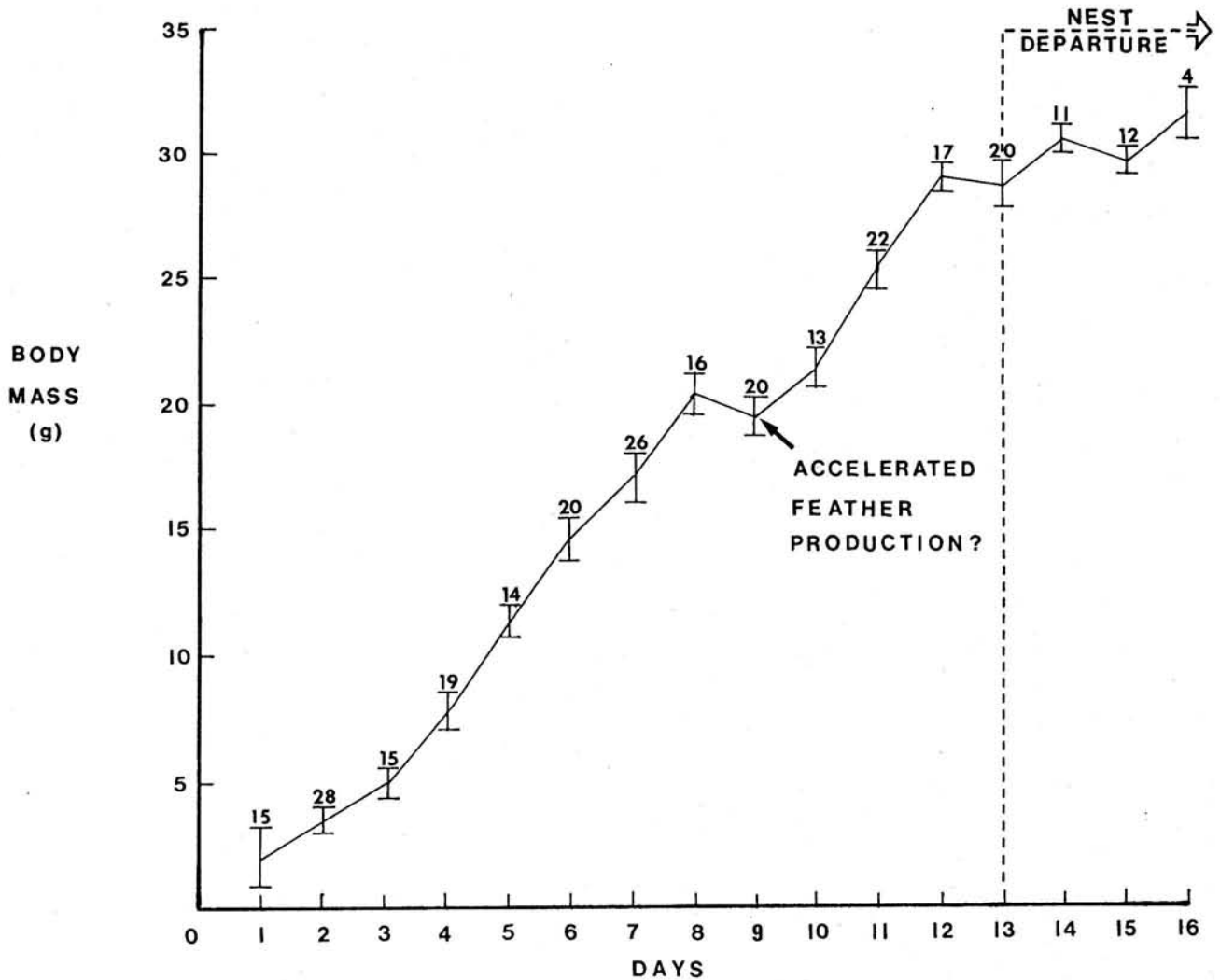


FIGURE 2: Gain in body mass and nestling period of Chestnut Weaver nestlings in Etosha National Park (1986). The number of nestlings weighed varied from 4-28 and is given against each reading. T-bars show standard error of the mean.

appear to be done exclusively by the female. During our measurement of chicks, females showed unexpected tolerance of our presence. We recorded only insects (lepidopterous larvae and small orthopterans) being fed to the chicks. Larger grasshoppers and an armoured cricket were brought to the nests with head, legs and wings removed. Chicks began chirping 3 days after hatching. Their eyes opened at 6 days, quills erupted and they became mobile at this stage. Nestlings were characterized by their heavily distended abdomens, confirming a prodigious food intake.

Nest departure was hastened by our repeated visits to the nests during the final stages of breeding. We believe that chicks handled late in the nestling period left the nest prematurely; this must be taken into account during future studies.

#### 4 DISCUSSION

Our observation that the first eggs laid in a clutch had the shortest incubation period, indicates that

incubation began with the first or second egg. This, in turn, would have survival value for the species in an arid environment, because only the larger nestlings in a brood would survive, as has been demonstrated in the Sociable Weaver *Philetairus socius* (Maclean, 1973). Furthermore, " . . . . this behaviour is characteristic only of arid-zone weavers . . . ." (Maclean, 1987 pers. comm.) and where asynchrony in hatching is encountered, it serves to reduce the brood size rapidly when food becomes limiting (Lack, 1966).

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