The Thickbilled Weaver at Nchalo, Malawi

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Introduction

Brown *et al.* (2001) give details of the biometrics, moult and breeding season of the Thickbilled Weaver *Amblyospiza albifrons* in Pietermaritzburg, South Africa. They comment on the paucity of biometric and moult studies on African bird species and on the smallness of sample sizes in published works. The authors also point out that there is geographical variation in the timing of moult within a species and that birds from a single area may be more synchronous in their timing of moult than the population as a whole. I report on occurrence, wing length, mass, breeding and moult of birds caught at Nchalo, in the lower Shire valley of Malawi, over 16 years.

Site and methods

Between 1974 and 1989, 644 Thickbilled Weavers were mist-netted at Nchalo (16°16'S 34°55'E, 60 m.a.s.l.) in open *Acacia Combretum* savanna woodland and thicket, as well as in a garden near a 0.25 ha pond, containing two small patches of *Phragmites* sp. reeds. The Shire River was c. 0.5 km away, but over much of that distance the ground was marshy (mainly during the wet season of October/November–March/April), with areas of *Phragmites*. The river was bordered by reeds and *Typha* sp. bulrushes along most of its c. 220 km course through the lower valley; the c. 500 km^2 Elephant Marsh in the middle of the river bed was close to Nchalo and there were smaller marshes in the beds of tributary streams. Hence there was a great deal of habitat suitable for breeding Thickbills in the vicinity of the trapping site. Off-season woodland habitat was scarce near the river, but there was some along tributaries and the valley sides were well wooded in many areas along its length.

Birds were ringed, measured (wing maximum chord with a stopped rule to 1 mm and mass to 0.1 g), examined for moult and, in the last few years only, for the presence of a brood patch. Thickbills were aged and sexed more or less as described by Laycock (1982). Primary moult was scored as 0 = old, 1 = missing or in pin, 2–4 = growing and 5 = new. Where a significant difference in measurements is given this was derived from a *t*-test on the difference of means.

Results

Seasonal occurrence

Fig. 1 shows the number of fully adult (c. 22–24 months old or more) and immature birds caught. Quite a lot of immatures were caught during winter, but the large pre-breeding influx in October–December included old adults, second year birds about to breed for the first time and the previous season's young. In January–May most of those caught (nearly all by the pond) were breeding adults and their young of the season, but from June, most were caught in the woodland and thicket areas, although some did visit the pond (which held water year round), either to drink or perhaps to prospect for suitable breeding territory (especially in October–December).

Measurements

Table 1 gives wing length and mass, adults being those of 22–24 months old or more. Wings of females were c. 9% shorter than those of males of comparable age and their mass was c. 23% less. Immatures had significantly shorter wings than adults ($P < 0.001$ in both sexes), even though many had completed their first primary moult. The wing length of four juvenile males increased by

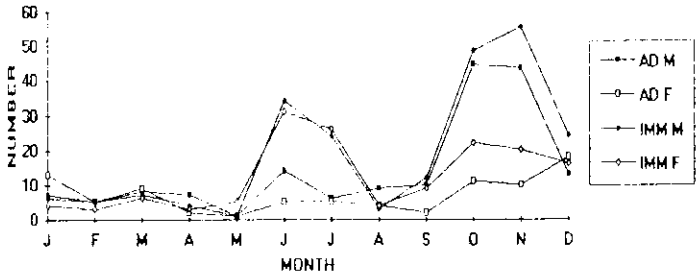

Fig. 1. Number of Thickbilled Weavers caught at Nchalo, Malawi, each month. Adults = 22–24 months old or more.

4–6 mm over their first two moults and that of two immatures, ringed after their first moult, increased by 2–3 mm after their second. Two juvenile females had only increased their wing length by 2–3 mm after their second primary moult. No bird was found to have increased its wing length at any later moult. The mass of immatures was less than that of adults ($P < 0.001$ in both sexes).

Breeding

Table 2 shows breeding indications. The area of reeds in my pond was small and only 2–4 black males bred each year, with perhaps a similar number of females (these were not counted). Usually nest-building started in mid- to late November and some nests were occupied by mid-December in most years. In 1972/3, 1975/6 and 1976/7 nests were checked 3–4 times between December and March. Complete clutches (of three or four eggs) were found from 18 December and the first newly hatched chick was found on 31 December, while a newly laid clutch was found on 11 February. In other years egg-laying may well have started earlier and there must have been eggs laid in late March or perhaps early April in some years. The dates of starting and finishing breeding varied from year to year, seeming to be dependent on rainfall and/or the depth of water in which the reeds stood. When November–January were relatively dry, breeding started late and nests were occupied until at least mid April. It is not known if the birds were double brooded. Not all females were checked for a brood patch. No female of c. 1 year old had an active brood patch, but few were examined. A few immature males were seen to be constructing nests, but it is not known if they bred before attaining full breeding plumage.

Very young juveniles, presumably hatched at my pond, were caught between 11 January and 7 April, but slightly older juve-

Table 1. Wing length and mass of Thickbilled Weavers from Nchalo over sixteen years. Adults = 22–24 months old or more.

Age, sex	No.	Wing length (mm)			No.	Mass (g)		
		Range	Mean ± SD	SE		Range	Mean ± SD	SE
Adult Male	169	91–101	94.6 ± 2.0	0.2	177	39.4–58.0	47.7 ± 3.7	0.3
Adult Female	92	81–90	85.8 ± 2.2	0.2	95	29.9–43.4	37.3 ± 3.8	0.4
Imm. Male	216	88–98	92.1 ± 2.2	0.1	223	40.1–55.2	45.8 ± 4.2	0.3
Imm. Female	131	78–88	84.2 ± 2.1	0.2	149	30.5–41.9	35.1 ± 2.8	0.2

niles were caught from 29 December until the end of May. These could have been hatched in nearby marshes. Thus the overall breeding season in the district might start in mid-November or end in mid- or late April, but was more commonly December–March.

Moult

Fig. 2 shows the moult state of birds caught each month. Breeding birds appeared to start moult very shortly after their chicks had left the nest and they and their chicks then left the vicinity of my pond (and trapping site). Immatures of c. 1 year old started their first primary moult slightly earlier; a young male was caught on 25 January with a P-score of 3, whereas the first adult in primary moult was caught on 12 February (P-score 7). Moulting immatures also disappeared from the trapping site in April/May and thereafter only the odd bird in moult was caught when a flock was feeding in the woodland or thicket areas. Those with a fairly low primary moult score in June probably started the moult in April, but some, mainly second year birds, had completed primary moult by June and practically all had completed wing moult by July.

First year birds, which did not have a complete moult until they were about a year old, did have a partial moult of some tertials, coverts and rectrices between June–July and October–November, while second year and adult birds had a partial pre-breeding moult from September.

One bird was caught twice during one moult cycle. On 23 March the P-score was 6 and on 19 June it was 49. This gives an estimated duration for the whole primary moult of 102 days (3.4 months). One male, c. 18 months old, was found to have suspended its moult (at P-score 10) some months before its capture in June, at which time moult had been completed. The reason for this suspension is unknown; moult suspension did not appear to be common in this weaver at Nchalo.

Longevity and site fidelity

Table 3 gives the number of birds which were recaptured in years after ringing. One male is known to have reached nine years old and another more than seven (since he was a black-plumaged adult when ringed). One female bred at the pond for three consecutive years and others for two years, but recapture rates over more than a year of 3.6% (adult-ringed) and 1.9% (immature-ringed), or an overall rate, including every recapture, of 4.1% do not suggest much fidelity to a natal, breeding or wintering site.

Only two birds were recovered, an adult

Table 2. Thickbilled Weavers breeding indications at Nchalo, Malawi. VJ = birds which had just left the nest, with wings incompletely grown. Young = slightly older, with wings fully grown. The breeding season is shown by a bar at the top of the table.

Indication	Months											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Breeding season	■	■	■	■	?						■	■
Nest construction	×	×	×								×	×
Complete clutches[1]	8	2										4
Nests with chicks	9	3	2									2
Active brood patch:												
new	4	3	1									1
oldish		2	2	1								
VJ caught	1	2	1	1								
Young caught	7	2	4	3	4							3

[1] clutches of three or four eggs

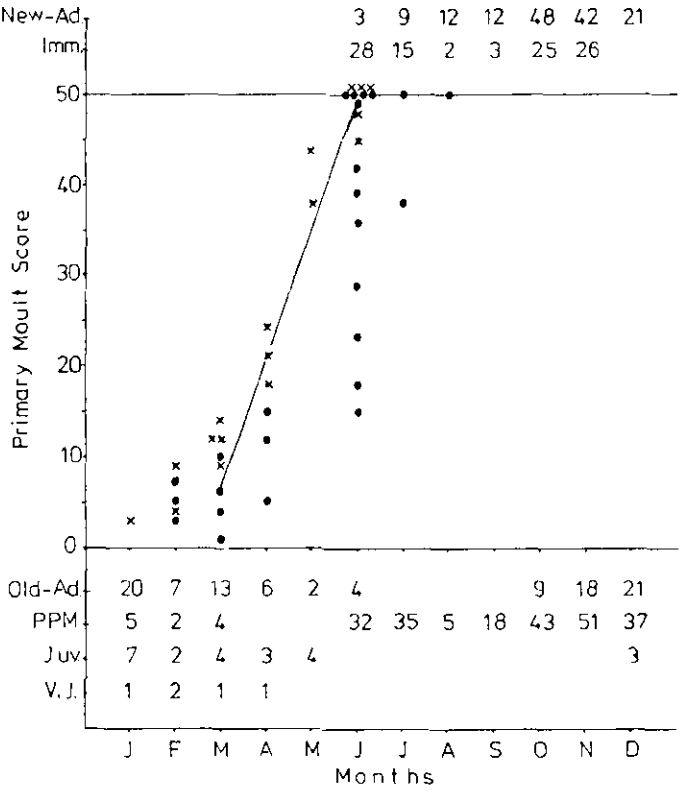

Fig. 2. Primary moult scores by month of Thickbilled Weavers from Nchalo, Malawi. Adult and immature (second year) birds in new plumage are shown above. Adults in old plumage and pre-primary moult immatures are shown below. Birds with a P-score of 50 had completed primary, but not secondary moult. PPM = pre-primary moult first year birds; Juv. = recently hatched; VJ = just left the nest, wings incompletely grown. Consecutive scores of one retrapped bird are joined by a straight line.
Adults = ●; 2nd year immatures = ×

Table 3. Number of Thickbilled Weavers recaught at Nchalo in years after ringing. Only one recapture per bird per year is given. Interim recaptures of birds last caught in a later year are given in brackets.

Age	No. ringed	Years after ringing									Total	
		<1	>1	>2	>3	>4	>5	>6	>7	>8	>1 yr	%
Adult	247	5	5(2)	2(1)	1	–	1	–	–	–	9(3)	3.6
Immature	362	3	4	2	–	–	–	–	–	1	7	1.9
Total	609	8	9(2)	4(1)	1	–	1	–	–	1	16(3)	2.6

female locally and an immature male c. 25 km away, but the latter does suggest that birds did move some distance, either during immature dispersal or during the non-breeding season. Only ten birds, ringed when fairly young, were recaught. None was necessarily hatched at my pond, all having been ringed and seven recaught in the non-breeding season. The other three, one male and two females, were recaught at the pond when breeding. All those ringed when adult (six males and eight females) were ringed and retrapped when breeding at the pond.

Discussion

Seasonal occurrence

Unlike Brown *et al.* (2001) and Laycock (1982) I caught most Thickbills during the non-breeding season. Brown *et al.* (2001) found a sex ratio of 1:2 (male:female) and Laycock (1982) recorded varying ratios at different times, with twice as many males in November–December, but in general found it to be 1:1. The overall sex ratio at Nchalo was roughly 2:1 (male:female), but among birds breeding at my pond it was 1:1; the flocks caught just before the breeding season (October–November) consisted of a high proportion of males, although among young birds caught in December to September, numbers of males and females were roughly equal.

Measurements

Wing length and mass of Nchalo Thickbills was less than that given for birds at Pietermaritzburg (Brown *et al.* 2001): presumably the subspecies at Nchalo is smaller. There is a considerable difference in wing length and mass between the sexes, as found by Laycock (1982) and Brown *et al.* (2001). However, the difference in wing length between first year, second year and fully adult birds seems not to have been given previously, although Brown *et al.* (2001) do say that biometrics is an ageing tool, but as they only give measurements of males and females, there is no indication of the size difference with age.

Breeding

Benson & Benson (1977) give the breeding season in Malawi as December–April, which fits Nchalo data, except that in some years breeding probably started in November and breeding in April was dependent on late rains. The breeding season is short and its timing depends on rainfall or water depth in the reedbeds. Birds at Pietermaritzburg bred from August/September to April (Laycock 1979, Brown *et al.* 2001), although perhaps with breeding in the extreme months only in some years. This longer breeding season than found at Nchalo, may be due to a different rainfall regime in Pietermaritzburg.

Moult

Brown *et al.* (2001) found that breeding and moulting seasons did not overlap, apart from one bird with a brood patch and no moult in April, but few were caught in March–April. Laycock (1979) did find breeding and moult to overlap and my figures over 16 years also show an overlap, because late breeders started moult after earlier breeding adults and there was some annual variation in breeding months.

Yearling birds started their first primary moult slightly earlier than did adults at Nchalo, but not two months earlier as found by Laycock (1982). This may be related to the earlier start to the breeding season in Pietermaritzburg. Brown *et al.* (2001) found primary moult to occur in adults only in April–June and do not mention its duration in individuals. Laycock (1982) found wild-caught adults (all from the same roost) to start between February–April (the females moulting P4 may well have started in February) and to complete primary moult between May–August, individuals taking about four months. At Nchalo adults started between February–April and completed between May/June–August, one bird taking 3.4 months to complete primary moult. Considering the shorter breeding season at Nchalo, it seems odd that the moulting season at Pieterma-

ritzburg (based on Laycock's (1982) larger sample) is almost identical; is the Thickbill double brooded there?

The short moulting season, found by Brown *et al.* (2001) may be due to the method of moult assessment. Merely to note 'active moult' does not show when an individual started, primary moult, nor when it was likely to complete it. Further, the minute sample on which those authors base their results may not have been representative of the local population as a whole.

Longevity and site fidelity

Brown *et al.* (2001) had a recapture rate of 26.7%, which, I assume, includes all recaptures. At Nchalo, only 4.1% were ever recaught. The Pietermaritzburg figures indicate high fidelity to feeding and/or breeding sites, whereas Nchalo figures suggest very low fidelity, to natal, breeding or off-season feeding sites. There were only 2–4 males breeding at my pond in any year, with a vast extent of suitable breeding habitat in the vicinity. Breeding birds may have been disturbed by my checking nests in three breeding seasons, by nets being placed close to the edge of the pond on occasion during the breeding season, or by the general disturbance that goes with gardeners working or dogs cooling off in the pond. If so, they may have elected to nest elsewhere the following year, although a few did return to breed for a second or third time, as may others have done, since I did not set out specifically to catch Thickbills. Likewise, non-breeding flocks had a huge feeding area, much of it some distance from the trapping site, hence recapture of these birds was relatively unlikely.

It is possible that Thickbills, especially males, were able to remove 4.3 mm Incoloy rings. All recaptured males had a squashed/flattened ring and one ring had a portion of one end broken off. The rings of recaptured females were less damaged, but all had been chewed and twisted. Some birds, mainly females, were ringed with 3.0 mm SS rings which they should not have been able to remove, but none of these was recaught, so perhaps disturbance and the size of the habitat were responsible for the low recapture rate.

A short life span is unlikely for a biggish, omnivorous bird (see Peach *et al.* 2001 for survival rates in granivores and insectivores/omnivores) and two males are known to have lived for over seven years. Since Malawians killed large numbers of birds, particularly of flocking or colonial species; for food during breeding and non-breeding seasons, it is possible that predation on Thickbills was fairly high, which would have reduced longevity and recapture rates. Unfortunately most Malawians were not prepared to admit to killing birds which belonged to Pretoria Zoo, so seldom returned rings.

Conclusion

Apart from size, there is little difference between Thickbilled Weavers at Pietermaritzburg and Nchalo, although breeding starts later at Nchalo, probably because the rainfall patterns differ. The breeding season at Nchalo is shorter, while primary moult duration and the timing of moult initiation in adults are similar, with breeding season and primary moult overlapping towards the end of the breeding season. Some immatures at Pietermaritzburg start primary moult earlier than do Nchalo immatures, probably because they hatched earlier.

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