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Moult and weight cycles in two species of *Lonchura* in Ile-Ife, Nigeria

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Summary

From April 1987 to June 1990 *Lonchura cucullata* and *L. bicolor* were examined for moult and weight. The birds moulted between May and October. The period of moult was estimated as 183 days for *L. cucullata* and 145 for *L. bicolor*. Adult females trapped on nests showed that reproduction and moult overlapped. Adult males reached their lowest weights in August and adult females between July and August, during the moult period.

Résumé

Des *Lonchura cucullata* et des *L. bicolor* ont été étudiés d'avril 1987 à juin 1990 pour leur mue et leur poids. Les oiseaux muaient entre mai et octobre. La durée de la mue fut estimée à 183 jours pour *L. cucullata* et à 145 jours pour *L. bicolor*. Les femelles adultes prises au nid montraient que reproduction et mue chevauchaient. Les mâles adultes atteignaient leur poids minimum en août et les femelles adultes entre juillet et août, pendant leur mue.

Introduction

As part of a study into the ecology of the Bronze Mannikin *Lonchura cucullata* and the Black and White Mannikin *L. bicolor* (see Akinpelu 1994), their annual cycles with particular regard to moult and weight were examined.

Methods

The data were collected from mist-netted birds or birds trapped on the nest during the period April 1987 to June 1990. Each bird was weighed and examined for stages of

feather growth of the primaries and secondaries. Individual feather growth was scored on a scale from 0 (= old) to 5 (= fully-grown) (Newton 1966, Pimm 1976, Wilkinson 1983, Aidley & Wilkinson 1983).

Both species have ten primaries and six secondaries on each wing so that the primaries have a maximum score of 100 and the secondaries a maximum score of 60. The scores were regarded as an index of the general state of moult.

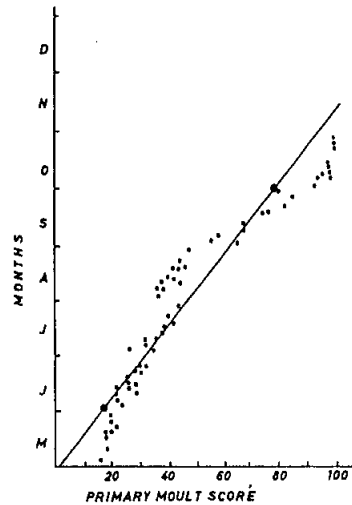


Figure 1. Scattergram of date plotted against primary moult score in *Lonchura cucullata*, where Day 1 = 1 May (plotted values are for 1988 and 1989).

Results

In total, 102 *Lonchura cucullata* and 74 *L. bicolor* were examined. Fig. 1 shows the scattergram of primary moult score in *L. cucullata* plotted against date. The regression equation for estimating the duration of moult in an individual is y (date) = 5.07 + 1.78x where x is the moult score (taking 1 May as day 1). The estimated duration of primary moult was 183 days. There was no significant difference between the progression of moult of males and females.

Fig. 2 shows the scattergram of primary moult score in *Lonchura bicolor* plotted against date. The regression equation is y = 2.46 + 1.43x where x is score (taking 2 June as day 1). The duration of moult was estimated as 145 days.

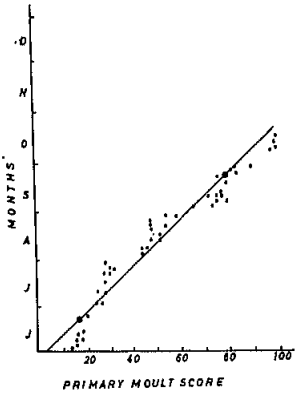


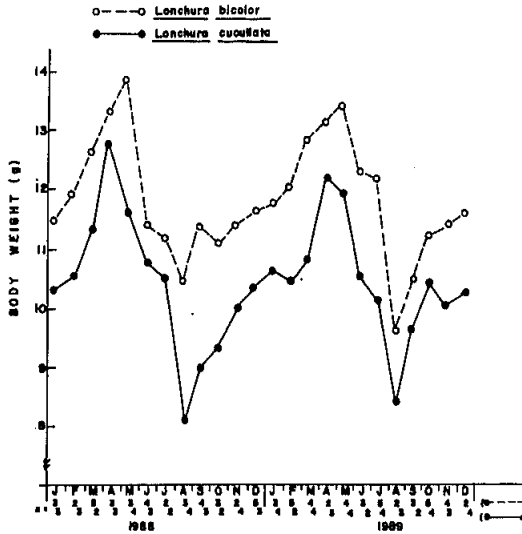
Figure 2. Scattergram of date plotted against primary moult score in *Lonchura bicolor*, where Day 1 = 2 June (plotted values are for 1988 and 1989).

Table 1. Simultaneous reproduction and moult in seven females of *Lonchura cucullata* and five females of *L. bicolor* trapped on the nest.

Date trapped	No. of eggs in nest	Moult of the right wing	
		Primaries	Secondaries
cucullata			
24 Jun 1989	2	5520000000	000002
22 Jul 1989	3	5553100000	000555
27 Jul 1989	3	5555400000	005555
27 Jul 1989	5	5555210000	015555
27 Jul 1989	4	5555310000	035555
18 Jun 1990	4	5553000000	000004
25 Jun 1990	4	5555300000	000455
bicolor			
25 Jun 1989	3	5552000000	100035
27 Jul 1989	4	5555531000	000555
27 Jul 1989	2	5555520000	002555
31 Jul 1989	2	5555540000	005555
31 Jul 1989	4	5555531000	005555

placement of flight feathers followed the pattern usual for passerine birds, with the mary remiges being dropped consecutively in descending order. It was observed at moult and feather growth on each wing were usually symmetrical, as found by oodall (1975) for Bronze Mannikin.

Table 1 shows that females of both species were moulting even when incubating gs. All these females were actively moulting the rectrices as well as the wing, and had a brood patch.



gure 3. Annual variations in mean body weight of males of two *Lonchura* ecies.

Fig. 3 shows the annual variations in the body weight of males of both species. oth were at their heaviest in April-May. It was observed that they spent most of eir time feeding during this period. Their weights then dropped sharply from June August. Weight began to increase from September to October, during the late ins.

Having finished laying in May-June 1988 the females lost weight sharply until ly-August, after which weight began to increase to an annual peak in May-June ig. 4).

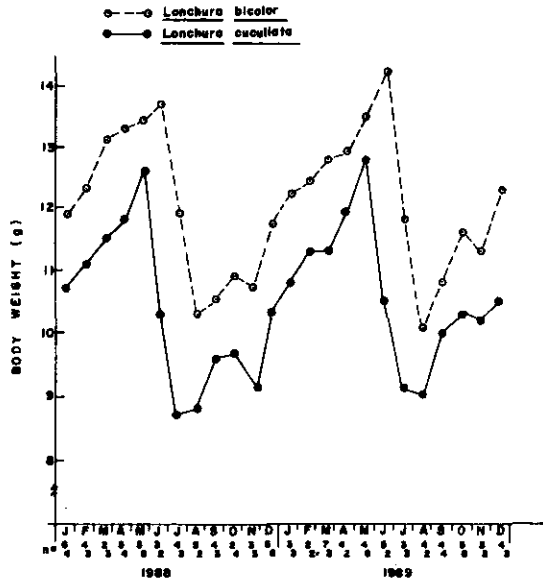


Figure 4. Annual variations in mean body weight of females of two *Lonchura* species.

Discussion

Moult occurred between May and October in both species which coincided with the period of a lush growth of vegetation and abundant grass seeds used as food (see Akinpelu 1994). From regression analysis, the estimated duration of moult (183 days) for *Lonchura cucullata* was longer than in *L. bicolor* (145 days) and similar to 183 days for White-browed Sparrow-Weaver *Plocepasser mahali* in northwestern Botswana (Jones 1978). Wilkinson (1983) showed that regression analysis can suggest a longer moult duration than indicated by retrap data. It is probable that if retrap data were available the estimated moult duration in an individual would be much shorter. However, moult and breeding cycles of adult *Lonchura* females showed some overlap.

Breeding and moult are two major events in the annual cycle and impose energetic demands on the individual. It seems that the protracted moult observed in *Lonchura* species and the associated small daily metabolic demand of feather production do not interfere with the competing demands of reproduction. This is equally the assertion of Jones (1978) for White-browed Sparrow-Weaver. Payne

(1969, 1980) suggested that compatibility of breeding and moult in the Scaly-feathered Finch *Sporopipes squamifrons* and Red-billed Firefinch *Lagonosticta senegala* may permit exploitation, by breeding, of temporary unseasonal rainfall in arid habitats. In such species it will be advantageous that moult is slow and comparatively undemanding so that if conditions deteriorate drastically moult can still be sustained and at the same time no constraint will be imposed on further breeding should favourable conditions persist or recur.

Adult males reached their lowest weights (Fig. 3) during the latter part of the rainy season (August) and adult females (Fig. 4) by mid-rainy season (July) perhaps because of reproductive stresses such as care of fledglings. These periods of lowest weights fell within the period of annual moult (May-October). The decrease in weight recorded during the moult is comparable to the findings of Fogden (1972) that most of the birds he studied in Southeast Asia lost weight during moult.

Acknowledgments

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References

AIDLEY, D.J. & WILKINSON, R. (1987) Moult of some Palaearctic warblers in northern Nigeria. *Bird Study* 34: 219-225.

AKINPELU, A.I. (1994) Breeding seasons of three estrildid species in Ile-Ife, Nigeria. *Malimbus* 16:94-99.

FOGDEN, M.P.L. (1972) The seasonality and population dynamics of equatorial forest birds in Sarawak. *Ibis* 114: 307-342.

JONES, P.J. (1978) Overlap of breeding and moult in the Whitebrowed Sparrowweaver in northwestern Botswana. *Ostrich* 49: 21-24.

NEWTON, I. (1966) The moult of the Bullfinch *Pyrrhula pyrrhula*. *Ibis* 108: 41-47.

PAYNE, R.B. (1969) Overlap of breeding and moulting schedules in a collection of African birds. *Condor* 71: 140-145.

PAYNE, R.B. (1980) Seasonal incidence of breeding, moult and local dispersal of Red-billed Firefinches *Lagonosticta senegala* in Zambia. *Ibis* 122: 43-55.

PIMM, S.L. (1976) Estimation of the duration of bird moult. *Condor* 78: 550.

WILKINSON, R. (1983) Biannual breeding and moult-breeding overlap of the Chestnut-bellied Starling *Spreo pulcher*. *Ibis* 125: 353-361.

WOODALL, P.F. (1975) The life history of the Bronze Mannikin. *Ostrich* 46: 55-86.