

### Body mass and moult of the breeding female

The breeding female was always the second most dominant bird in the colony and usually the second heaviest, the dominant breeding male being the heaviest (Table 2). The mass of the breeding females ranged from 45,6 - 51,8 g ( $x = 48,9$ ;  $SD = 1,8$ ) (Earlé in press). The breeding female of colony 14 had a mass of 46,2 g when first ringed on 14 September 1982 and on 3 November 1982 a mass of 51,8 g, the day before this female started her second clutch.

Although four Whitebrowed sparrowweavers were caught while in primary moult during the August to November part of the breeding season, none of these birds were breeding females or dominant males of their respective colonies. Most birds only started moulting the primaries during the first week of December. New clutches were still being laid in December and two females which started clutches during the second and third weeks of December were caught on the nest, incubating and in full primary moult.

## DISCUSSION

It seems as if the Whitebrowed sparrowweaver responds to rainfall for breeding as there was a definite upsurge in the breeding on all three occasions that rain fell in the study area (Figure 1). The majority of the females laid more than one clutch during the breeding season. Although McLachlan & Liversidge (1978) mention a breeding season from September to January, breeding in the study area commenced in August. By having several nests per colony it is possible for the female to start breeding soon after the first rains as an existing nest is converted to a breeding nest within a few days. The strategy employed by Whitebrowed sparrowweavers of using old nests to start breeding early before fresh nesting material is available, is noteworthy as in many other weaver species the availability of nesting material is a constraint. Collias & Collias (1978) mention a total of 65 feathers in the sleeping nest they analysed. This is only 7,6% of the number found in the nest analysed in this study. The reason for this large difference is not clear but might be due to extremely cold winters experienced in the study area where minimum temperatures of below freezing are frequent. Consequently these feathered nests are better insulated. McLachlan & Liversidge (1978) state that breeding nests are lined with fluffy grass-tops and feathers but in the study area all sleeping nests examined ( $n = 60$ ) were only insulated with feathers.

Both Mackworth-Praed & Grant (1960) and McLachlan & Liversidge (1978) recorded the clutch size of the Whitebrowed sparrowweaver as two or three eggs. In the present study 14,6% of the clutches consisted of only one egg. The clutch size is probably determined to a large extent by environmental factors. Three of the one-egg clutches were laid early in the season, during August and the first week of September. No three-egg clutches were laid in September, possibly because not enough high protein food was available during this period. (cf. Jones & Ward 1976, Earlé 1981a). The one-egg clutch of the female from colony 4 was laid only seven days after the young fledged (Figure 4). This probably did not give the female enough time to build up an adequate protein reserve to lay a bigger clutch although she was capable of doing so (Figure 4). From figure 4 it is clear that if two consecutive clutches were laid less than six weeks apart, the second clutch was always smaller than the first. Collias & Collias (1978) estimated the incubation period at approximately 14 days. This was confirmed in this study. The nestling period of 21 - 23 days as found in the present study was not previously reported.

Collias & Collias (1978) mentioned that on average nestlings were fed 11,7 times/hour. In this study the three nestlings in colony 9 received only 8,2 feeds/hour each and the two nestlings in colony 5 received only 4,9 feeds/hour each. This lower number of feeds per nestling found in the present study is probably due to the larger broods being fed. In seven broods that Collias & Collias (1978) mentioned, only one consisted of two young, all the others were one-nestling broods. Nesting success in the present study was much higher than that indicated by the data in Collias & Collias (1978) and a success of 40,0% is considered high for any passerine (Earlé 1981b). The pattern of timing of nest predation as shown in Figure 8 is similar to that found by Earlé (1982) for the Whitebellied sunbird *Nectarinia talatala* with two peaks of predation viz. early in the incubation stage and early in the nestling stage, when feeding activities make the nest conspicuous.

From this study and from Jones & Ward (1976) it seems as if the primary moult of the Whitebrowed sparrowweaver starts early in December in southern Africa. Because this species is probably able to adapt quickly to favourable environmental conditions and breed at such times, the moult and breeding can overlap when favourable conditions occur and moult is already in progress. Because of the slow moult in a number of Ploceidae adapted to arid or semi-arid conditions (Maclean 1973) moult and breeding schedules can overlap in the Whitebrowed sparrowweaver.

### OPSOMMING

Broeiaktiwiteit is gevolg in 21 kolonies van die Koringvoël *Plocepasser mahali* naby Bloemfontein in die broeiseisoen wat gestrek het vanaf Augustus 1982 tot Januarie 1983. Wyfies het een tot vier broeisels per seisoen gelê met een tot drie eiers in elk, 63,4% van die neste waarin daar gebroei is, was ou slaapneste wat reeds in die vorige seisoen gebou is. Later in die seisoen is sekere neste spesiaal vir broei doeleindes gebou. Alhoewel twee kleur tipes eiers gelê is het dieselfde wyfie elke maal dieselfde tipe gelê. In drie gevalle het meer as 20 mm reën op 'n slag in die studie area geval en in al drie gevalle is daar enkele dae daarna 'n aantal nuwe broeisels gelê. Die inkubasie periode was 14 dae ( $\pm 1/2$  dag) en die kuikens het tussen 21 en 23 dae in die nes vertoef. In 'n kolonie waar ses individue die kuikens gevoer het, het die kuikens byna twee maal soveel voedings ontvang as waar net twee volwassenes die kuikens gevoer het. Kuikens wat deur meer as twee volwassenes gevoer word het 'n hoër groei tempo en verlaat die nes gouer as die kuikens in die kleiner kolonies. Uit 40,0% van die eiers wat gelê is het kuikens gebroei wat die nes verlaat het en 0,43 kuikens is by die populasie gevoeg vir elke volwasse reeds in die populasie.

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