

PATTERNS OF PRIMARY MOULT IN THE WEAVERS, PLOCEIDAE

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Abstract

Patterns of renewal of feathers are poorly known in African birds. Moulting is energetically costly and is thus an important part of a bird's annual cycle; moulting needs to be fitted in with breeding activities, and in some species, migration. Ringers in southern Africa have been submitting primary moulting data to SAFRING, the South African Bird Ringing Unit, since 1998, providing a large amount of data that the author has been curating and checking on an on-going basis as Ringing Coordinator. My main interest is in the weaverbirds and I have ringed several thousand Southern Masked Weavers *Ploceus velatus* and many other species. Les Underhill and Walter Zucchini developed a statistical model to analyse timing and duration of primary moulting in a standardized way in 1988. Primary moulting was analysed in the southern African weaverbird family using the Underhill-Zucchini method throughout. In some species, this method was applied to individual feathers as well as the whole wing.

Two weaver species are restricted to arid and semi-arid regions of southern Africa, the Sociable Weaver *Philetairus socius* and Chestnut Weaver *Ploceus rubiginosus*. Primary moulting and biometrics were analysed in these species. Both species have a relatively slow moulting as an adaptation to life in semi-arid regions. The Red-billed Quelea *Quelea quelea* is a migrant found throughout southern Africa, allowing comparisons of moulting parameters in arid and mesic environments. Geographic variation in breeding seasonality and primary moulting parameters was investigated in the following weavers in South Africa: Cape Weaver *P. capensis*, Southern Masked Weaver, Village Weaver *P. cucullatus*, Yellow Weaver *P. subaureus*, Spectacled Weaver *P. ocularis*, Thick-billed Weaver *Amblyospiza albifrons*, Southern Red Bishop *Euplectes orix*, Long-tailed Widow *E. progne*, White-winged Widow *E. albonotatus*, Red-collared Widow *E. ardens*, and Fan-tailed Widow *E. axillaries* and Yellow Bishop *E. capensis*.

Breeding and primary moulting start earlier in the Western Cape, a winter rainfall region, than in the summer rainfall region of South Africa. Two species, the Southern Masked Weaver and Thick-billed Weaver, have undergone range expansions in the last century and the new populations show evolving patterns in the timing of moulting.

Annual variation in start date of moulting was investigated in Cape Weavers, Southern Red Bishops and Southern Masked Weavers in the Western Cape. For the first

two species, there was wide variation in start dates due to variability in timing of rainfall in different years.

Primary moult followed closely after breeding. The annual cycle of southern African weavers was less variable in the mesic eastern part of southern Africa. The more regular rainfall of the mesic regions allowed weavers to grow more than one primary simultaneously. In the arid regions weavers grew one primary at a time.

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