PHYSICAL PROPERTIES OF NESTS OF THE COMMON FISCAL SHRIKE (*Lanius collaris subcoronatus*) IN THE KALAHARI DESERT, SOUTH AFRICA

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ABSTRACT

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We identified territories of Common Fiscal Shrikes at the 5337 ha Damhoek Farm (28°19'S, 22°25'E) in the Kalahari Desert in northwestern South Africa. Nest sites were noted and after the breeding pair had finished their reproductive attempt for the season, we measured the physical parameters of the nest, its location in relation to the height of the nesting tree and the distance to the closest neighbouring nest. Owing to the drought during the 1998-1999 breeding season, only 2 of the 20 pairs observed attempted to breed. None successfully fledged young. The average distance between nests was 115 m (SD = 55.7, N = 21, range 17-210 m). The average outer diameter of the nests was 120 mm (20.6, 9, 90-140 mm), average inner diameter – 70 mm (7.6, 8, 60-80 mm), average depth of the inner cup – 55 mm (20.8, 10, 35-100) and the average external height of the nest structure was 95 mm (14.4, 11, 70-120 mm). The average height of the nest from the ground ($m \pm SD$, N: 2.35 m ± 1.46, 20) was significantly correlated (r = 0.823, df = 19, p = 0.0001) to the height of the nest tree (3.34 m ± 2.95, 20). The Camel Thorn (*Acacia erioloba*) was the major (55%) nesting tree species used by shrikes. Trees also used were Grey Camel Thorn (*A. haematoxylon*) – 20%, Black Thorn (*A. mellifera*) – 1.5%, Monkey Thorn (*A. galpinii*) – 5% and Buffalo Thorn (*Ziziphus mucronata*) – 5%.

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INTRODUCTION

The Common Fiscal Shrike is one of the most common of the central and southern African passerines (Hall and Moreau 1970). The species has a wide distribution throughout the continent south of about 10°N, *i.e.* from equatorial to sub-tropical

habitats (Macdonald 1980). This adaptation to different regions and habitats has given rise to several subspecies (*cf.* Lefranc 1997).

Although the Fiscal Shrike is relatively well studied in comparison to most other African passerines (Zack 1986), it is not well studied in comparison with some of the *Laniidae* spp. of the Northern Hemisphere (Devereux 1998). Little is known about the behaviour and ecology of the species in general, and of six subspecies (*smithii, humeralis, capelli, pyrrhostictus, subcoronatus, collaris*) in particular. Harris and Arnott (1988) and Harris (1995) suggest that there may even be two separate species composed of northern and southern subspecies. To date only three detailed studies have been conducted – two of equatorial populations (*L. c. smithii* – Macdonald 1980, *L. c. humeralis* – Zack 1986) and a recent one in eastern South Africa (*L. c. collaris* – Devereux 1998).

The Common Fiscal Shrike is resident and non-migratory in South Africa (Harris and Arnott 1988). The Southern African region (Republic of South Africa, Namibia, Zimbabwe) is home to three of the six subspecies. Reproductive data from nest records and collected by the South African Ornithologists' Society, today BirdLife South Africa, were analysed and published by Cooper (1971) and Marshall and Cooper (1969), but are restricted to the years before 1969. Although these studies do not mention the subspecies, based on the distribution maps (Lefranc 1997) and the findings of Clancey (1980), it is safe to assume that a large portion of the data from Zimbabwe (then Rhodesia) pertain to the subspecies *subcoronatus*.

We planned to study the reproductive success of the Common Fiscal Shrike in the Kalahari Desert. However, due to a drought in the region, birds built nests but did not lay eggs. Here we present the physical properties of the nests measured during March-July 1999. We have compared our data to that presented in Cooper (1971) assuming that the data presented for Zimbabwe relates to the subspecies we are continuing to study in the south-eastern part of the Kalahari Desert.

METHODS

At the Damhoek Farm (28°19'S, 22°25'E), Kalahari Desert, northwestern South Africa, we identified 20 territories of Common Fiscal Shrikes by following a conspicuous individual for a minimum of 4 h. We attempted to find active nests, *i.e.* with either eggs or nestlings, during March-July 1999, which is considered to be the range of the breeding season for the species (Ginn and Herremans 1997). Although on many of our visits we observed courtship or initiation of nest building, we found only one abandoned nest with a clutch of 4 eggs. Nest sites were noted and after the breeding pair had finished their reproductive attempt for the season, we measured the physical parameters of the nest, its location in relation to the height of the nesting tree, and the distance to the closest neighbouring nest. On several occasions, we found trees with several nests from past seasons. Only the most recently built nest was included in this study. All data are presented as mean, ± *SD* and *N*.

RESULTS AND DISCUSSION

Harris and Arnott (1988) and Lefranc (1997) found that most Common Fiscal Shrikes, particularly those living in relatively arid areas, nest during the rainy season. Our study area is very close to Namibia, where the precipitation is less than 250 mm per year, and insect abundance increases after rains (Samways 1994). Hence, it is no surprise that during the drought of the 1998-1999 breeding season, probably resulting in low insect abundance, only 2 of the 20 pairs that built nests produced eggs. Only one nest was found with eggs and it did not fledge young.

The average height of the nest ($N = 20$) above the ground was 2.35 m (± 1.46, 20) and concurs with Cooper (1971), who found that the Common Fiscal Shrike prefer to nest between 1-3 m above the ground. The nest height was significantly correlated ($r = 0.823$, $df = 19$, $p = 0.0001$) with the height of the nest tree (average 3.3 m ± 2.95, 20). This implies that nest height was probably a result of suitable and available sites, and height may not necessarily be a limitation as implied by Cooper (1971). He suggested that the fact that nests in the south were placed lower than in the northern regions was probably due to the more stunted indigenous vegetation. Devereux (1998) found that the median height on her study site in Kwazulu-Natal, South Africa was 1.65 m (1.25-2.5 m, $N = 32$). In Ghana, Macdonald (1980) observed that all nests were placed between 1.5 and 4.5 m.

In our study area, the Camel Thorn was the major (55%) nesting tree species used by the shrikes. Other trees used were Grey Camel Thorn – 20%, Black Thorn – 1.5%, Monkey Thorn – 5% and Buffalo Thorn – 5%. Devereux (1998) found that shrikes in her study chose more than expected to nest in the non-native *A. nilotica*. She suggested that this happened because the tree species had dense canopy and probably provided increased protection or support for the nest. Vegetation analysis confirms that it is less common in Alpine grassland than in other grassland types (Osborne and Tigar 1990). Ginn and Herremans (1997) suggested that this might be due to extreme climatic conditions, a shortage of nest sites and perches or a combination of these factors. The above exhibits their versatility to exploit indigenous and exotic, introduced vegetation to suit their requirements.

The Common Fiscal Shrike in the Kalahari Desert, similar to the nests described elsewhere for the species (*e.g.* Devereux 1998) and for all other *Laniidae* (Lefranc 1997), constructed open cup-shaped nests of twigs that were lined with soft annuals. The average outer diameter of the nests was 120 mm (*SD, N*, range: 20.6, 9, 90-140 mm), average inner diameter – 70 mm (7.6, 8, 60-80 mm), average depth of the inner cup – 55 mm (20.8, 10, 35-100 mm), and the average external height of the nest structure was 95 mm (14.4, 11, 70-120). Cooper (1971) reported the outer diameter average 130 mm (range: 100-180, $N = 20$), the internal depth – 75 mm (65-90, 26), and the height of the structure – 95 mm (65-120, 14). He reported that nest walls were about 27.5 mm thick. He found no geographical varia-

tion in size and thought that the size and shape of the nest site dictated differences in size.

We studied 20 pairs on our study site. The average distance between neighbouring nests was 115 m ($SD = 55.7$, $N = 21$, range 17-210 m). We have not yet mapped the territorial boundaries of each of the pairs, however, it is obvious that nests are not located in the epicentre of the territory but in a suitable nest tree.

The Common Fiscal Shrike is one of the few true-shrike species of the world that is not endangered, nor are its populations in decline. Understanding its ecological requirements and its ability to adapt to anthropogenic habitat changes could be useful information for reversing the declines of some Northern Hemisphere shrikes.

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