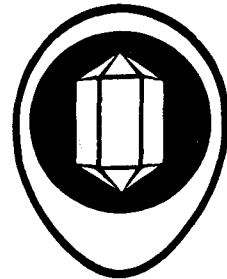


Lanioturdus torquatus
Drosselwürger

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ADAPTATION OF BIRDS TO ARID AND SEMI-ARID HABITATS IN CENTRAL S.W.A.

A Preliminary Report (not to be quoted as reference)

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A. Introduction

I will start first by explaining the word adaptation as I understand it. Adaptation is the mechanism whereby a bird (or any other organism) can increase its survival value. In other words it is some sort of trick, or tricks, that the bird uses in order to increase its chance of survival in the environment. This comes about through evolutionary mechanism, of course, and certainly not conscious effort on the birds' part! Most of the adaptations about which I will be talking are adaptations to rainfall regimes; others I will mention because they are rather interesting examples illustrating evolutionary theory.

For three years I was engaged in a comparative bird breeding biology study in the Namib Desert Park and four other study areas in slightly higher rainfall country, with different topography, different altitudes and different distances from the sea. One was near Gamsberg on a farm called "Djab" which is about 14 000ha, situated at the base of the Gamsberg Pass. Secondly, Daan Viljoen Park just to the west of Windhoek which was the smallest study area, only 4 000 ha. Djab is about 180 km inland, Daan Viljoen Park about 255 km, Windhoek about 265 km. The third study area was "Ameib", about 14 000 ha and the fourth comprised Klein and Groot Spitzkop, an area of about 12 000 ha.

B. Description of Study Areas

The rainfall in the Namib Desert Park varies from about an average of 15 mm to 100 mm in the northeastern corner. I have no accurate record from the latter part but there are recording stations at Gobabeb and Ganab, and sub-stations nearer to the coast at Swartbank and Rooibank. Swakopmund has a 40-year-record. I want to mention the rainfalls here because they are rather important to the bird biology of this region. At Spitzkoppe I have no accurate records over a long period but it is around 120-130 mm. At Ameib it is 248 mm, averaged over a period of 18 years. In the Gamsberg region it is approx. 215 mm, somewhat less than at Ameib. At Daan Viljoen it is the same as in Windhoek, namely 367 mm average (Windhoek is 366 mm). In the case of Daan Viljoen the records stretch over 9 years, in the case of Windhoek over 60 years.

In 1970 no sign of nesting at Ameib could be found at all, and no juveniles were seen. In 1971 also no nesting could be traced, certainly not in the Khan biotope. These observations are difficult to explain although the rainfall pattern in the three years of the study follows that of the Namib Park.

Table 3

Rainfall at Ameib July 1968 - June 1971

	<u>1968-1969</u>	<u>1969-1970</u>	<u>1970-1971</u>
Rainfall	349 mm	139 mm	204 mm

One must conclude that the drought of '69-'70 exerted such a crippling effect that the birds had not recovered even by the 1971 winter when presumably they should have nested, after a rather average rainy season. The evidence also suggests that this species is yet another opportunist breeder, nesting when conditions are favourable.

It is interesting to note that the female Double-banded Sandgrouse is quite cryptic, whereas the male is by contrast quite strikingly coloured. In this case the male may do most of the night incubation.

7. Gray's Lark *Ammomanes grayi*: This endemic species of the Namib plains is one of the most interesting desert birds. It shows a number of adaptations to its relatively harsh environment, and it is clearly an opportunist breeder. Its food during nesting is exclusively insects. It is preyed on by Lanners *Falco biarmicus* and Red-necked Falcons *F. chicquera*. Since it lives in the barest gravel flats of the Namib, even at the coast or near it, it must obviously be vulnerable to aerial predation. It is very cryptic in dorsal colour, and takes refuge, both from sun and predators, in gerbille burrows. Its courtship flights and song are performed in the dark, usually in the early morning hours before the first light of dawn. This flight performance was independently discovered by Willoughby in 1965-66 (published 1968, 1971) and myself in 1968. It is a remarkable performance, and as far as known, unique among the diurnal Alaudidae.

Willoughby discovered two nests of Gray's Lark, and Niethammer published a note on another nest in 1969. Both Willoughby and Niethammer (*operibus citatis*) have drawn attention to the erroneous record of Hoesch (1958) whose nest, attributed to this species, belonged without question to *Mirafra (Certhilauda) albescens*, the Karoo or Dune Lark.

This species bred in good numbers in 1969 (7 records); in 1970, a dry year, no breeding took place and in 1971 I had 6 records of breeding. It is quite obvious that this species is geared to the rainfall. In 1971 for example I kept a closer check on the local conditions and found that a place near Mirabib in the middle of the Namib Park, 30 km east of Gobabeb, a local shower fell in March and brought up a good cover of grasses, and immediately Gray's Lark came into the area and started displaying. Subsequently several nests were found but it seemed that many of the larks which had displayed did not in fact nest there presumably because there was insufficient space and food available in that grass patch which was some 2 km square in extent and well isolated by at least 12 km from the next nearest grass patch.

The nest is very thick walled and, therefore, much better insulated than other lark nests, and it is also much deeper. The eggs are thus never reached by the sun, although the nest is often completely unsheltered in the plains. The adult is very cryptically coloured, but the downy chick with its bright orange beak and skin, is not.