

Duetting in Namib Desert Klipspringers

Duetting is the rapid and precise exchange of calls between two individuals. It has evolved in one form or another among a variety of birds,^{1,2} as well as some primates.³⁻⁵ This report describes a form of duetting performed by mated klipspringers, *Oreotragus oreotragus*, a small antelope (mean mass of 8 males = 11.4 kg; of 7 females = 11.8 kg)⁶ that occurs throughout southern and eastern Africa on isolated rocky outcrops and steep rocky slopes of mountains and gorges.⁷

My main study population was five klipspringer groups inhabiting the rocky canyon walls of the Kuiseb River, 45 km upriver from Gobabeb (23°45'S, 15°0'E) in the Namib Desert, South West Africa. From June 1976 to February 1977, I spent 118 days making over 400 h of observations. The social unit of these five groups and 17 other groups censused regularly along 30 km of canyon, was a monogamously mated adult pair with up to two younger animals presumed to be their offspring (mean group size = 2.6 ± 0.5 individuals). During the course of this study klipspringer vocalizations in response to potential predators were recorded with a Uher 4400 tape-recorder at 9.5 cm/s using an AKG D-160 microphone fitted to a 50 cm parabola. Sound spectrograms were produced with a Kay Elemetric sound spectrograph on wide band settings and are the subject of this report.

Potential predators upon klipspringers in the Kuiseb Canyon include spotted hyena, black-backed jackals, chacma baboons, leopard, caracal and perhaps large raptors. Among the five study groups three adults and two lambs were lost; the lambs to jackals and at least one adult to hyenas. I observed klipspringers responding with flight and alarm calls to jackals, chacma baboons, and myself. This response to baboons is appropriate here as well as elsewhere in Africa, for adult males often capture and eat neonate gazelles.^{8,9}

When such predators are detected, klipspringers emit a series of loud vocalizations.¹⁰ In 74 encounters between klipspringers and potential predators, 47 (64%) elicited a vocal response; in the remaining 27 encounters klipspringers fled with no audible

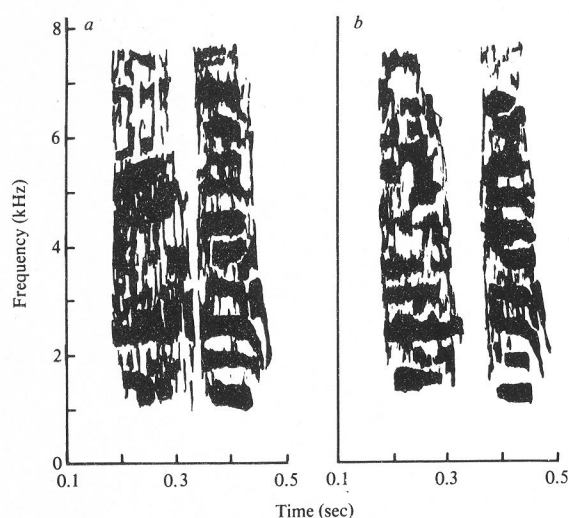


Fig. 1. Ink tracing of sound spectrograms illustrating two typical duetted alarm calls by a mated pair of klipspringers. In each duet the first note is given by the male, the second by the female: (a) illustrates the minimum time lapse between male and female components, (b) the maximum. Mean time between the male and female components of the duet is 0.03 s (S.D. ± 0.02 s, $R = 0.01-0.05$ s, $N = 9$). The complete duet has a mean duration of 0.29 s (S.D. ± 0.01 s, $R = 0.28-0.31$ s, $N = 9$).

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vocalization. When first surprised a single call is given. The group then flees 30 to 50 m higher up the rocky slope of the canyon. When a prominent boulder or ledge is reached they resume calling. Their calls are a loud forceful exhalation. Measurements from aerial photographs indicated calls are audible to about 700 m. Either sex may be the first to call, but after 2 to 4 notes the female's call becomes precisely timed to follow closely that of the male (mean interval = 0.03 s, Fig. 1). Immatures do not participate when the adults are calling, although they do give a single rendition of the call if they are the first to notice the disturbance. Among 15 encounters with eight solitary individuals of both sexes, no loud calls were elicited.

The klipspringers' vocalization, with its male and female components, resembles the duetting of monogamous primates³⁻⁵ and tropical birds that remain paired throughout the year.^{1,2} Unlike ventriloquial alarm calls of certain passerines,¹¹ which provide relatively few clues about the caller's location, klipspringer calls indicate specifically where they are calling from. Their calls begin and end abruptly, are high-pitched, and have a rich harmonic structure (Fig. 1). These are characteristics which facilitate directional location of a signaller by recipients making binaural comparisons of phase, time and sound intensity.¹² The rapid repetition of the calls provides recipients ample opportunity to obtain this information. During 14 time-recorded calls from five different groups, duetted alarm calls occurred about every three seconds (mean = 3.1 ± 0.7 s). Thus, an average calling bout of 5.4 min (S.D. ± 6.5 min, range = 2-20 min) included over 100 duetted alarm calls.

Among birds, depending on the species and the habitat they occupy, duetting may aid in individual recognition of pair mates and thus reduce the chances of hybridization among closely related species.¹ Duetting also may promote continuous contact among mated pairs when in dense vegetation,¹³ facilitate rapid synchronization of breeding in a capriciously fluctuating environment,¹³ or advertise the possession of a territory.¹⁴ In another context, klipspringers in the Namib duet only in response to potential predators. Thus, their duetting may have evolved as an adjunct of alarm signalling to promote pair bond maintenance. The loudness of the duet, which is audible for much greater distances than required to signal the immediate family group, and its repetitive delivery, may also function to warn neighbours of the presence and precise location of danger.

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