

HOW BODY SIZE SHAPES BEHAVIOR AND ECOLOGICAL NICHE DIFFERENCES IN AFRICAN UNGULATES

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Study Description

Variation in body size among co-occurring species may be associated with differences in foraging behavior that enable competitors to coexist. We tested this hypothesis by monitoring the habitat selection, movements, and diets of three congeneric spiral-horned antelopes (bushbuck *Tragelaphus sylvaticus*, nyala *T. angasii*, and kudu *T. strepsiceros*) in Mozambique's Gorongosa National Park. Various metrics of movement and space use scaled allometrically with body mass, leading to pronounced differences among the three species in diet composition and quality. Such allometric scaling of behavior may be a mechanism underpinning the coexistence of closely related species in animal communities worldwide.

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Photo 1. African savannas exhibit spatial heterogeneity in tree cover, which influences the behavior of herbivores that feed on woody plants. The thicket clumps in the foreground of this image of Mozambique's Gorongosa National Park are mounds of fungus-farming termites (*Macrotermitinae*), which enrich the soil and enable the growth of nutrient-rich woody vegetation in a matrix of saline grassland. Bushbuck, nyala, and kudu all selected habitat near termite mounds and predominantly ate mound-associated plant species, but the strength of these effects decreased with body size (strongest in ~35 kg bushbuck, weakest in ~120 kg kudu). Photo credit: Rob Pringle.



Photo 2. A vigilant female bushbuck standing on a termite mound in Gorongosa National Park. The bird plum tree, *Berchemia discolor*, which occurs almost exclusively on termite mounds, accounted for roughly a third of the average bushbuck diet in Gorongosa. Photo credit: Rob Pringle.



Photo 3. A female kudu foraging in semi-arid central Kenya. Across Africa, up to four congeneric species of spiral-horned antelope can co-occur side by side. Differences in body size among sympatric species, and associated differences in nutritional requirements and foraging behavior, may be key to sustaining this diversity. Photo credit: Rob Pringle.



Photo 4. Researchers collect data from a chemically immobilized female bushbuck on a termite mound in Gorongosa. The bushbuck has just had a GPS collar fitted around its neck to track its movements. At left, Ryan Long uses a portable ultrasound machine to measure fat and muscle depth. At right, Rob Pringle prepares to collect a fecal sample for diet analysis. Photo credit: Rob Pringle.



Photo 5. Researchers use a portable ultrasound to measure the pregnancy status of a newly collared female nyala, a medium-sized antelope (~70 kg). Photo credit: Hallie Walker.

These photographs illustrate the article “Allometry of behavior and niche differentiation among congeneric African antelopes” by J. H. Daskin, J. A. Becker, T. R. Kartzinel, A. B. Potter, R. H. Walker, F. A. A. Eriksson, C. Buoncore, A. Getraer, R. A. Long, and R. M. Pringle published in *Ecological Monographs*. <https://doi.org/10.1002/ecm.1549>