

Genetic Patterns in Forest Antelope Populations:
Implications for the Conservation of Key Species in the
Udzungwa Mountains, Tanzania

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ABSTRACT

The field of conservation genetics, in combination with non-invasive sampling, provides a powerful set of tools for investigating the conservation status and natural history of rare species that are otherwise difficult to study. A systematic literature review demonstrated that this is certainly the case for many forest-associated antelope species, which are poorly studied and yet constitute some of the most heavily hunted wildlife in Africa. The aim of the present study was to use non-invasive sampling to investigate genetic patterns in forest antelope populations in the high-biodiversity Udzungwa Mountains, Tanzania, within the context of the conservation of these species and the wider ecosystem.

Genetic information was derived from faecal samples collected across the Udzungwa landscape and assigned to five antelope species ($N = 618$, collected 2006-09). Faecal pellet length was measured for a subset of samples but statistical assignment to species by this method proved unreliable. Phylogenetic analysis using mitochondrial control region sequences unexpectedly revealed that Harvey's duiker within the Udzungwas are paraphyletic with respect to sequences from a putative sister species from southern Africa. However, there was no corresponding pattern in the microsatellite dataset suggesting that these mitochondrial lineages do not represent contemporary genetic isolation. Instead, Harvey's duiker nuclear variation is shaped both by isolation by distance, due to positive spatial autocorrelation at short distances, and clustering of distinct genotypes from western outlying forests. These forests also harbour the endangered Abbott's duiker and therefore require effective conservation management. Despite being detected throughout the Udzungwas, genetic diversity in Abbott's duiker was very low in comparison to other species. These results suggest several promising research directions but also have significant conservation implications that will be disseminated to the Tanzanian wildlife authorities and the wider conservation community.

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