Molecular Phylogeny of Duiker Antelope (Mammalia: Cephalophini)

by

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ABSTRACT

Molecular sequence data, comparative cytogenetics, and fluorescence *in situ* hybridization (FISH) were employed to study evolutionary relationships within the duiker antelope (tribe Cephalophini). The results of the different data sets are highly concordant. Mitochondrial DNA sequences (the full cytochrome *b* gene and a 767 bp portion of the 12S rRNA) were analyzed from all 19 recognized species. Complete species representation and good cytochrome *b* resolution allowed for the retrieval of four adaptive lineages, the conservative dwarfs *(Cephalophus monticola, C. maxwellii)* which were the most basal clade, the savanna specialist *(Sylvicapra grimmia)* which groups apart from all the forest duiker, the giant duiker group *(C. silvicultor, C. spadix, C. dorsalis, C. jentinki)*, and the red duiker lineage *(C. leucogaster, C. rufilatus, C. nigrifrons, C. natalensis, C. harveyi, C. callipygus, C. weynsi, C. ogilbyi, C. rubidus, C. niger)*. The placement of the endangered *C. zebra* and the enigmatic *C. adersi* remains obscure.

Conventional chromosome banding showed a 2n=60 complement in *C. spadix* extending previous observations that speciation in duiker antelope does not involve euchromatic rearrangements or variation in diploid number. At a finer level, fluorescence *in situ* hybridization with species specific satellite fragments derived from the chromosomal DNA of *C. maxwellii* and *C. monticola*, resulted in intense fluorescence to the centromeric regions of the autosomes of all species *(S. grimmia, C. dorsalis, C. maxwellii, C. monticola, C. natalensis, C. silvicultor, C. spadix)*. However, variation in hybridization to the X and Y chromosomes allowed for some distinction among taxa. These results are consistent with the delimitation of the four adaptive groups suggested by molecular analysis and the published morphological data which, when taken together, question and in some instances support several of the nomenclatural divisions in current use in duiker taxonomy. These include the recognition of *Philantomba* as genus name for *C. monticola* and *C. maxwellii*, an arrangement that would secure *Cephalophus* monophyly, and that *C. harveyi* be relegated to a subspecies of *C. natalensis*.

Keywords Duiker, Cephalophini, systematics, phylogeny, mitochondrial DNA, cytochrome *b*, 12S rRNA, biogeography, comparative cytogenetics, fluorescence *in situ* hybridization.

For Mom, Dad, and Miriam
with love

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