

CONSERVATION GENETICS OF ASSOCIATION OF ZOOS AND AQUARIUMS  
AND WILD MATSCHIE'S TREE KANGAROO (*DENDROLAGUS MATSCHIEI*)  
FROM HUON PENINSULA, PAPUA NEW GUINEA

BY

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## ABSTRACT

The Association of Zoos and Aquariums (AZA) Matschie's tree kangaroo (*Dendrolagus matschiei*) population is at a critical point for assessing long-term viability; they have endured a founder effect and have low mitochondrial DNA (mtDNA) diversity. The mean kinship (MK) strategy is used to preserve their genetic diversity by minimizing the overall kinship of the population; however, the MK strategy has not been evaluated in an AZA population. Wild *D. matschiei* is listed as endangered and genetically unique populations may warrant management as separate conservation units. My objectives were to: i) develop molecular markers to facilitate genetic analyses, ii) assist AZA and wild *D. matschiei* management decisions, and iii) further resolve *Dendrolagus* molecular systematics. To achieve my objectives I analyzed DNA extracted from AZA, captive held, and wild *D. matschiei*, and three additional *Dendrolagus* taxa using microsatellite markers and two mtDNA genes. AZA *D. matschiei* have similar nuclear DNA genetic diversity as captive and wild *D. matschiei* from Papua New Guinea, and the MK strategy has maintained their genetic diversity as well as predicted by theoretical expectations. AZA *D. matschiei* should continue to be managed by their studbook analyses and the MK strategy. Wild *D. matschiei* showed evidence of phylogeographic structure, but should be managed as one conservation unit. Preliminary genetic evidence suggests *D. matschiei* and Lowland tree kangaroo (*Dendrolagus spadix*) are sister taxa, and supports the reclassification of Golden-mantled tree kangaroo (*D. goodfellowi pulcherrimus*) and Ifola (*D. dorianus notatus*) as species. An improved understanding of *Dendrolagus* genetics will contribute substantially to their conservation.