



EVOLUTION, LIVING PATTERNS, AND MITOCHONDRIAL GENETIC VARIATION IN CHIMPANZEES

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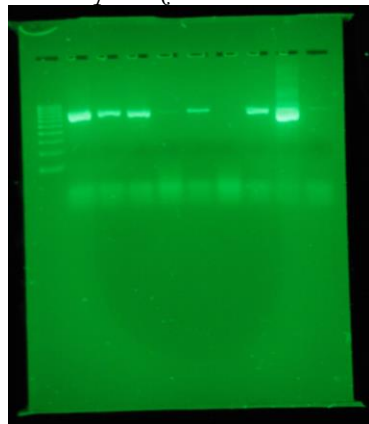
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ABSTRACT

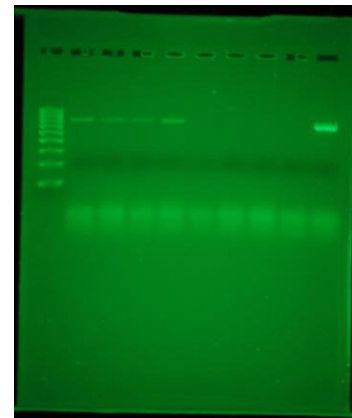
The study of genetic variation in chimpanzees allows researchers to determine evolutionary origins, population dynamics, living patterns, and more; the focus of this thesis is on the *Pan troglodytes verus* subspecies of chimpanzees of western Africa. After reviewing the literature, I set out to test two hypotheses: first, males within a community of western chimpanzees in Senegal will share mitochondrial haplotypes with each other that they do not share with the females; second, *Pan troglodytes verus* will have mitochondrial DNA that is similar to those of other chimpanzee subspecies, implying a similar evolutionary origin. Fecal samples were noninvasively collected from the Fongoli area near the Niokolo Koba National Park in Eastern Senegal, and then transported to the University of Utah's Department of Anthropology for analysis in an evolutionary genetics laboratory. DNA extraction was attempted for six of the twelve samples received. After optimizing the conditions, mitochondrial DNA derived from these extractions was then replicated using PCR, and checked for successful amplification via agarose gel electrophoresis testing. Amplification was successful for four out of the six samples: LI and TM (female), and SI and FO (male); PCR purification was performed on these samples before sending them to the HSC DNA Sequencing Core Facility at the University of Utah. DNA sequences were analyzed using MEGA; the sequences were compared to each other, and to DNA sequences for the *Pan troglodytes verus* mitochondrial genome already in the literature. Results were also compared to DNA sequences for other chimpanzee subspecies, to bonobos, and to humans to show evolutionary trends and relatedness. Results from my experiments came back mostly inconclusive due to poor quality of the DNA sequences. Future research can be done using the PCR conditions optimized through my experiments.



*Final optimization results**



*Fecal extraction results***



*Gel lanes from left to right: 100bp ladder, 8 samples (6 yielding significant DNA), and a negative control.

**Gel lanes from left to right: 100bp ladder, the four successful samples, a negative control, two unsuccessful samples, another negative control, and a positive control.

