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Record of a North American Cougar (*Puma concolor*) from Southern Illinois

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ABSTRACT

A cougar (*Puma concolor*) was recovered in the proximity of railroad tracks in Randolph County, Illinois on July 15, 2000. A necropsy indicated that the cougar died from injuries it received when struck by a train. The animal appeared to be in good health prior to the accident, and no indications of captive rearing were observed. Genetic data were used to verify that the cougar was of North American origin and not an escaped or released cougar of South American origin. This is the first confirmed occurrence of a cougar in Illinois in over 100 years.

INTRODUCTION

On July 15, 2000 officials of the Illinois Department of Natural Resources retrieved the carcass of a cougar from Randolph County, Illinois. The native range of cougars stretches from the Yukon to Argentina, and in North America from California to the Maritime Provinces of Canada (Hansen 1992). While cougars were native to Illinois, predator control efforts of the last two centuries and habitat alteration have extirpated cougars from the entire Midwest (Hansen 1992). The last resident cougars were removed from Illinois prior to 1860 (Danz 1999). The closest known cougar populations are in Texas and Colorado. However, there is evidence for the existence of cougars in the Arkansas Ozarks (Witsell et al. 1999) as well as eastern Kentucky and Tennessee (Nowack 1976) and there have been recent unconfirmed cougar sightings in southern Illinois. Some cougars found outside of their current range are escaped or released captive animals, and many of those cougars are of South American origin.

In a recent study of 315 cougars from North and South America including 31 of 32 putative subspecies, Culver et al. (2000) compared partial DNA sequences of several mitochondrial genes. They found that cougars from North America are genetically homogeneous and distinct from South American cougars. Only two mtDNA haplotypes were found north of Panama, one of which was restricted to the Olympic Peninsula of the Pacific Northwest. Cougars from Panama and South America are genetically more diverse; however no South American cougar possessed either of the North American mtDNA haplotypes. Thus mtDNA provides a reliable method of determining whether

the cougar killed in Randolph County Illinois was of North American origin, and therefore potentially a wild cougar, or of South American origin and an obvious captive release.

METHODS

The cougar carcass was frozen by IDNR personnel and shipped to Southern Illinois University, Carbondale where a necropsy was performed. The animal was weighed and measurements taken. The nature of the trauma to both external and internal anatomy were noted. A piece of tongue was taken for genetic analyses.

Whole genomic DNA was extracted from tongue tissue using a commercial DNA extraction kit (Quiagen Inc.). Portions of two mitochondrial genes (ATP-8ase and ND-5) were amplified using primers described in Johnson et al. (1998). Each 50 µl PCR reaction contained 5 µl 10X buffer (Promega Inc.), 65 ng cougar genomic DNA, 2 mM $MgCl_2$, and 2.5 picomoles of each PCR primer. PCR products were prepared for cloning using a commercial kit (Quiagen Inc.), ligated into a TA cloning vector (Promega Inc.), and cloned into DH5α competent cells. Miniprep plasmid DNA was obtained using a commercial kit (Promega Inc.) and sequenced on an ABI 377 automated DNA sequencer. Sequences were compared to published sequences from Culver et al. (2000).

RESULTS AND DISCUSSION

The cougar was a 226 cm long male with a tail length of 72.5 cm and a total weight of 50 kg. Based on a combination of cementum annuli and tooth wear criteria the cougar was estimated to be a 4-6 year old adult. The head was nearly detached from the carcass between the 2nd and 3rd cervical vertebrae, and was connected to the carcass by only a few strands of dorsal skin. Findings were consistent with blunt trauma as a cause of death. There was no indication that the cougar had recently worn a collar, nor was there wear on the foot pads consistent with cage or pen habitation. Stomach contents included partially digested material (skin, hair, bones) from a single white-tailed deer (*Odocoileus virginianus*) fawn. The cougar exhibited well-developed musculature and abundant visceral/mesenteric fat.

DNA sequences at both mitochondrial genes were identical to those of haplotype "M" reported as the common mtDNA haplotype in North American cougars by Culver et al. (2000). Sequences of the Illinois cougar differed from all South American mtDNA haplotypes by at least one substitution in the ATP-8ase gene and two substitutions in the ND-5 gene. Thus the cougar killed by the train in Randolph County Illinois was of North American origin and appears to have been successfully foraging in the wild prior to its accidental death.

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