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NYS MUSEUM SCIENTIST CO-AUTHORS STUDY ON WOLVES, COYOTES

Albany, New York -- 5/20/2011

A State Museum scientist has co-authored a new research article, representing the most detailed genomic study of its kind, which shows that wolves and coyotes in the eastern United States are hybrids between gray wolves, coyotes and domestic dogs.

Dr. Roland Kays, the Museum's curator of mammals, was one of 15 other national and international scientists who collaborated on the study that used unprecedented genetic technology, developed from the dog genome, to survey the global genetic diversity in dogs, wolves and coyotes. The study used over 48,000 genetic markers, making it the most detailed genomic study of any wild vertebrate species.

The research results are especially relevant to wolves and coyotes in the Northeast. The study shows a gradient of hybridization in wolves, with pure wolves in western states and increasing hybridization as you move east. Wolves in the western Great Lakes area averaged a genetic makeup of 85 percent wolf and 15 percent coyote, while wolves in Algonquin Park in eastern Ontario averaged 58 percent wolf, and the 'red wolf' in North Carolina was only 24 percent wolf and 76 percent coyote. Populations of eastern coyotes, which only colonized the region in the last 60 years, were also minor hybrids, with some introgression of genetic material from wolves and domestic dogs. For example, Northeastern coyotes, including those in New York State, had genetic material primarily from coyotes (82 percent), with a minor contribution from dogs (9 percent) and wolves (9 percent). Midwestern and southeastern coyotes were genetically 90 percent coyote, with an average of 7.5 percent dog and 2.5 percent wolf.

The advanced genetic techniques used in this study also allowed the scientists to estimate when the hybridization initially occurred. Kays said "In most cases this breeding across species lines seems to have happened at times when humans were hunting eastern wolves to extinction, and the few remaining animals could find no proper mates, so took the best option they could get." Kays continues, "The exceptions were an older hybridization between coyotes and wolves in the western Great Lakes dating from 600-900 years ago, and a coyote-dog hybridization in the eastern U.S. about 50 years ago, when coyote were first colonizing eastern forests."

This study also provides fresh data on the controversy over the species status of the Red Wolf in North Carolina, and the Eastern Canadian Wolf in Ontario. Both are medium-sized wolves that some have argued represent unique species. However, this new detailed genetic data shows both are the result of hybridizations between coyotes and wolves over the last few hundred years, and do not share a common origin in a unique eastern wolf species.

This research is also relevant to a recent U.S. Fish and Wildlife proposal to remove the western Great Lakes wolves from the Endangered Species Act by showing that those wolves are only marginally hybridized with coyotes, should be considered a subspecies of the Gray Wolf, and have no genetic ties to a more endangered form of eastern wolf.

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The research is published online in *Genome Research*, an international, peer-reviewed journal that publishes outstanding original research that provides novel insights into the genome biology of all organisms, including advances in genomic medicine.

This study follows another research paper co-authored by Kays last year in the journal *Biology Letters*, which used museum specimens and genetic samples to show that eastern coyotes hybridized with wolves to rapidly evolve into a larger form over the last 90 years, dramatically expanding their geographic range and becoming the top predator in the Northeast. This hybridization contributed to the evolution of coyotes from mousers of western grasslands to deer hunters of eastern forests. The resulting coy-wolf hybrids are larger, with wider skulls that are better adapted for hunting deer.

In the past, Kays has also studied coyote diet and distribution in Albany's Pine Bush and in the Adirondack Mountains. His research indicated that deer accounted for approximately one-third of the coyote's diet and that they made extensive use of forested areas. Kays also writes a blog about his research for the *New York Times* "Scientist at Work" feature. This blog is the modern version of a field journal, a place for reports on the daily progress of scientific expeditions — adventures, misadventures and discoveries. Kays' posts can be found at <http://scientistatwork.blogs.nytimes.com/author/roland-kays/>

The New York State Museum is a program of the New York State Education Department's Office of Cultural Education. Started in 1836, the Museum has the longest continuously operating state natural history research and collection survey in the United States. Located on Madison Avenue in Albany, it is open Monday through Saturday from 9:30 a.m. to 5 p.m. It is closed on Thanksgiving, Christmas and New Year's Day. Admission is free. Further information about programs and events can be obtained by calling (518) 474-5877 or visiting the museum website at www.nysm.nysed.gov.

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