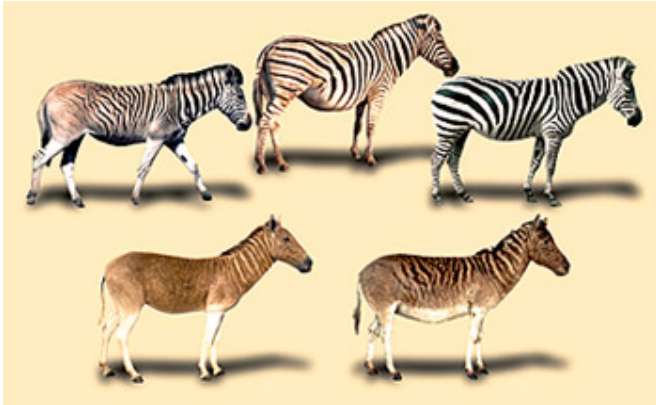


How a Zebra Lost its Stripes: Rapid Evolution of the Quagga

26 September 2005



DNA from museum samples of extinct animals is providing unexpected information on the extent and effect of the Ice Age as well as the path of species evolution, according to a report by scientists from Yale University, the Smithsonian Institute and the Max Planck Institute for Evolutionary Anthropology.

Image: Existing zebra (top row) and extinct quagga

The quagga, *Equus quagga*, a South African relative of horses and zebras, having a front half with zebra-like stripes and a back section like a horse with no marking, became extinct about 100 years ago. The pelt from a quagga museum specimen was the subject of tissue sampling that launched the field of ancient DNA analysis.

“Twenty years ago this exact species opened the field of ancient DNA studies on extinct animals,” said one of the authors, Gisella Caccone, senior research scientist in the Department of Ecology and Evolutionary Biology at Yale. “Now, thanks to technological advances in the field, we revisited

the story and used a population level approach to this question by analyzing a larger fragment of DNA and multiple specimens.”

In the past, the quagga has alternatively been described as a species and a subspecies of the Plains zebra. These researchers asked how and when the quagga diverged from all the remaining related horses, zebras, and asses. They compared the genetics, coat color and habitats of existing zebras with related extinct species.

The mitochondrial DNA markers from 13 museum specimens, including the only skeleton in museum collections, which is at Yale’s Peabody Museum of Natural History, showed that quagga likely diverged from Plains zebra about 120,000 to 290,000 years ago during the Ice Age. These results suggest that the quagga descended from a population of plains zebras that became isolated and the distinct quagga body type and coloring evolved rapidly.

This study reveals that the Ice Age was important not just in Europe and North America, but also in Africa.

“The rapid evolution of coat color in the quagga could be explained by disrupted gene flow because of geographical isolation, an adaptive response to a drier habitat, or a combination of both of the two forces,” said Caccone.

The research team also included Scott Glaberman at Yale, Jennifer A. Leonard and Robert C. Fleischer from the Smithsonian Institute, Michael Hofreiter and Nadin Rohland from the Max Planck Institute for Evolutionary Anthropology.

Source: Yale University

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