

Surprising Evidence

Dire wolves are one of the most famous prehistoric carnivores from the Ice Age, so it was quite a surprise when scientists recently announced that they were not wolves. Or at least not closely related to the wolves we know here in North America, the gray wolves.

Most people assumed dire wolves and gray wolves were closely related due to their similar bone structures, skull shape and size, diet, and overall body shape. These conclusions were drawn from studies using the 3,600 dire wolf skeletons from La Brea Tar Pits in California as well as samples found all over North America. Recently, researchers turned to molecular evidence to understand more about these predators. Preserved DNA in bones of five dire wolves ranging in age from 50,000 to 12,000 years ago from collections in Idaho, Wyoming, Ohio, and Tennessee showed unexpected results.

Using genome sequencing technology researchers looked for similarities between gray wolves, African wolves, African wild dogs, jackals, foxes, coyotes, and dire wolves. Organisms that are more closely related will have DNA that is more similar than those organisms that are distantly related. They found that the dire wolf does not share enough derived alleles with gray wolves or coyotes to suggest they have ancestry in wolves, coyotes, or any of their recent North American ancestors. Derived alleles are alleles generated over time through random mutation; the original non-mutated allele is referred to as the ancestral allele. This analysis of genetic information resulted in scientists revising their model of relatedness.

All of these animals are canids in the family Canidae, so they do share a common ancestor alive 16 million years ago. Over time, there have been divergences and the DNA evidence suggests that the dire wolf split from the ancestor of jackals, African wild dogs, gray wolves, and coyotes nearly 6 million years ago. Dire wolves had about 5 million years of thriving as an efficient pack hunter of Ice Age bison, camels, and other large herbivores in North America. This isolation from other wolf-like populations enabled specialization (on large prey) in the dire wolves. While this made them successful for a time, it may have contributed to their extinction at the end of the Ice Age when larger herbivores became less available.

About 1 million years ago, the Eurasian ancestor of gray wolves and coyotes headed east, over the Bering Land Bridge. These new canids overlapped in territory, behavior, and prey species of the dire wolves. Because they diverged from this more recent common ancestor, gray wolves and coyotes could interbreed. The dire wolf, however, was too different and did not interbreed. This also may have reduced its chances of adapting when the climate changed.

