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Palaeogenetics enlightening the ecology and evolution of species

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For many years after its inception the study of ancient DNA was restricted to short fragments of mitochondrial DNA from single specimens, drastically limiting its usefulness. However, the last ten years have seen a dramatic increase in the amount of data, including an extension from mitochondrial to nuclear DNA as well as the advent of new analytical methods for interpreting the data. We are now in a position to not only decipher the phylogenetic position of extinct species using complete mitochondrial genomes but can reconstruct the population dynamics of species over time, investigate – and resurrect – functionally important genes, and even reconstruct complete genomes of extinct species. I will show how recovering the temporal patterns of population size in species allows more informative speculations about the contributions of environmental change versus human impact to species extinctions. I will also discuss the possibilities of deciphering phenotypic characteristics of extinct species via DNA analyses and evaluate the prospects and limitations of palaeogenomics.