

Large Mammal Differences Between Fossil and Modern Communities: Implications for the Reconstruction of Hominin Paleoenvironments

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The reconstruction of past hominin habitats is an important aspect of attempts to understand and interpret patterns of human evolution, since it provides the ecological context in which humans evolved. Paleoenvironmental reconstructions rely on modern faunal communities as models for fossil assemblages. While this is a valid and necessary aspect of paleoecology, it is important to explore any factors that may produce fundamental differences between modern and fossil faunal assemblages. To this end, community structure of the large mammal faunas of African Plio-Pleistocene hominin-bearing localities and modern communities was compared. The ecovariates employed in this analysis are locomotion and diet. A Principal Component Analysis (PCA) of the ecovariates revealed the distinctiveness of fossil assemblages compared with most modern large mammal communities. A detailed examination of these differences indicates that the lower abundance of non-terrestrial carnivores is a major factor in the separation between fossil and modern faunal communities. This may be due to inherent differences between fossil and modern carnivore communities, taphonomic factors, difference in ecovariate coding methods for modern and fossil animals, or a combination of all three. Results of the PCA also showed that, with the exception of forest communities, it is difficult to distinguish between modern large mammal faunal communities based on ecovariates. All modern non-forest communities group together to the exclusion of modern forest communities with little or no distinction. This indicates that faunal community structure based on ecovariates cannot be used to discriminate between different non-forest communities. These factors should be taken into account when considering the community structure of fossil assemblages and reconstructing hominin paleoenvironments.

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