

Combining fossil enamel stable isotopes and dental microwear texture analysis to assess dietary niche-partitioning among primates (Cercopithecidae and Hominidae) from the Lower Omo Valley, Ethiopia.

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The fossil record from the Shungura Formation in the Lower Omo Valley, Ethiopia, includes several species of primates. Diet is an important aspect to assess niche partitioning. Here, we combine stable isotope analysis and dental microwear texture analysis (DMTA) of hominid and cercopithecoid molars to study dietary partitioning. We focus on the period from ~2.3 to 2.0 Ma because of the high taxonomic diversity. Cercopithecoids are represented by *Theropithecus*, *Papio*, and the colobines *Paracolobus* and *Rhinocolobus*, and hominids by *Australopithecus*, *Paranthropus*, and *Homo*.

We developed a DMTA-based dietary morphospace using PCA of 20 textural characteristics on a dataset of four extant primate species (n=104) with different diets. In the DMTA morphospace, fossil *Theropithecus* (n=44) falls near its extant congener, the gelada, whereas fossil *Papio* (n=32) lies closer to modern vervets than their extant counterparts. Smaller sample sizes of the colobines (n=9) show the extinct *Rhinocolobus* had a diet most similar to the arboreal *Colobus guereza* whereas the terrestrial *Paracolobus* had a highly variable diet, including hard objects. For the hominids, DMTA data show no evidence of durophagy. The diet of *Paranthropus* (n=10) falls closest to that of *Theropithecus*. Smaller data sets for *Homo* (n=4) and *Australopithecus* (n=2) suggest variable diets that fall farther outside of the extant primate morphospace compared to *Paranthropus*.

Carbon isotope data show that *Paranthropus* (n=18) and *Theropithecus* (n=19) both had C4-dominated diets, thus overlapping in both isotopic and DMTA space. *Papio* (n=11) shows a high range of $\delta^{13}\text{C}$ values, mirroring the diversity in the DMTA PC1. The diet of *Homo* (n=10) spans C3- to nearly C4-dominated values and overlaps considerably with *Paranthropus*. *Australopithecus* (n=4) has a wide $\delta^{13}\text{C}$ range; colobines (n=9) have C3 diets, but based on DMTA results, sourced different foods.

Mots-Clés : Africa; primates; ecology; Pleistocene; teeth