

## Ecomorphological diversity of carnivoran mammals

**Abstract:** The remarkable phenotypic diversity between and within species represents one of the most salient patterns across the Tree of Life. Why some clades exhibit morphological stasis for much of their evolutionary history whereas others have diversified into numerous morphological forms? And similarly, why do some populations exhibit greater intraspecific variation compared to other populations? Here, I investigate how phenotypic variation between and within carnivoran species contribute to their overall biological diversity. First, I tested if ecological and phylogenetic effects led to distinct modes of evolution among the cranial, appendicular, and vertebral regions in extant carnivoran skeletons. Second, I assessed how sexual selection and niche divergence influenced the evolution of sexual dimorphism in musteloid skulls. Lastly, I examined whether intraspecific variation in tool using behavior leads to different foraging success within a population of sea otters. Overall, this work highlights the benefits of phenotypic diversity across clades and within single populations.