

COMPARATIVE PALEOECOLOGY OF PALEOGENE AND NEOGENE MAMMALIAN FAUNAS: BODY-SIZE STRUCTURE

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In mammalian assemblages, size distributions reflect conditions of vegetation and climate as well as biotic interactions among mammals. Paleogene (Wyoming/Montana) and Neogene (Siwalik) mammalian faunas depict strikingly different size distributions in the cenograms below (rank v. size of herbivorous and omnivorous species), because evolutionary increase to substantial size did not become widespread among lineages until the middle Eocene (after our record).

In the Paleocene to early Eocene, substantial faunal turnover with accompanying change in guild structure occurred with little change in size distributions. While maintaining relatively small sizes, lineages of modern mammalian orders replaced species from archaic groups. However, most mammalian lineages experienced size increase, especially through the Wasatchian (early Eocene).

From the middle to late Miocene, significant size increases occurred upsection within several families of Siwalik carnivores, artiodactyls, and rodents. Families of insectivores, primates, proboscideans, and perissodactyls exhibited little change in species sizes despite changes in species composition and number. The trend toward increasing size preceded the widespread development of C4 grasslands in the Siwaliks, suggesting that biotic rather than abiotic factors influenced the size increase.

