

Summary of Primate Evolution

Primate evolution can be summarized as a series of adaptive radiations preceding the emergence of hominids.

1. The initial radiation began in the Paleocene or late Cretaceous and led to forms such as the Plesiadapiformes. They differed from insectivores primarily on the basis of their cheek teeth morphology (and maybe ear structure). Their brains, special senses, locomotion etc. were little changed. Perhaps the most significant change in was related to diet: seeds, fruits or other vegetal matter were added to a basically insect diet.
2. The second radiation beginning in late Paleocene or earliest Eocene produced a wide variety of much more advanced lemurlike and tarsierlike forms. They possessed grasping hands and feet with nails instead of claws and their brains and faces were reorganized to emphasize vision rather than olfaction. A possible selective advantage for these morphological advances may have initially focused on their enhanced ability to hunt insects among the slender branches in forest undergrowth.
3. A third radiation beginning in late Eocene or early Oligocene produced a variety of higher primates. They were basically quadrupedal, arboreal and differed little from their Eocene ancestors except they had larger brains and vision was even more important. They were mainly frugivorous and this difference in diet differentiates them strongly from their prosimian predecessors.
4. A fourth radiation or set of radiations during the late Oligocene or early Miocene produced higher primates that clearly anticipate the extant apes and monkeys. The main difference initially between apes and monkeys was dental (monkeys had a propensity to eat leaves). To begin with, apes were much more abundant than monkeys probably because of the fruit-rich forests that dominated the tropical and subtropical areas of Africa where both were living.
5. The fifth radiation in the middle and later Miocene produced a variety of apes with specialized dentition that included thick enamel, large molar chewing surfaces and relatively small, non-interlocking canines, a radiation probably sparked by cooler, drier and more seasonal climates which led to the spread of woodland and savanna lands. These dental adaptations were probably in response to masticating hard or grit-encrusted plant foods.