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WITH THE COMPLIMENTS OF:

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Monkey

Grade or level of primate evolution characterized by moderate body and brain size, usually with a long tail, frugivorous or folivorous diet, above-branch quadrupedal locomotion, and multimale social organization. There are two main groups of monkeys in the modern primate fauna, the ateloids, or platyrrhines, of the Neotropics and the cercopithecids. At least one distinct group of fossil primates is also termed *monkey*, the Eocene-Oligocene parapithecids of North Africa. The most important evolutionary aspect of the concept *monkeys* is that it is not a phyletic term: Those animals called monkeys are not each other's closest relatives. Instead, it represents an informal grade of organization, such as those denoted by *ape*, *human*, or *prosimian*. Among the monkeys, the platyrrhines are the sister taxon of all of the Old World anthropoids or catarrhines. Similarly, the closest living relatives of the cercopithecids are the hominoids (apes plus humans), while the extinct parapithecids, once thought to be specially related to cercopithecids, are now thought to be the sister taxon of all other anthropoids. This confusing concept of monkey, having no real evolutionary meaning, arose before evolution was understood, as an outgrowth of the *scala naturae* thinking of the time. Nonetheless, we can use this concept to compare the two main types of living monkeys.

Platyrrhine Monkeys

The New World monkeys, or superfamily Ateloidea, include two families whose arrangement differs somewhat among



Brazilian *Callithrix jacchus*, the common marmoset, clinging to a tree trunk which it has gouged for sap feeding. Photograph by W.G. Kinzey.

and often distinguishable at the genus level. Social organization varies as well, with monogamy and a range of multimale patterns known. It is also interesting to note that ateloids are characterized by the early occurrence of extinct members of several modern lineages, either generic or subfamilial.

Catarrhine Monkeys

Two groups of Old World anthropoids may be called monkeys: the living Cercopithecidae and the extinct Parapithecidae. In addition to their features discussed by contrast to ateloids, cercopithecids retain ischial callosities, tough sitting pads that are probably an ancestral character of catarrhines. Their molars are uniformly bilophodont, with two parallel crests that interlock with those of opposing teeth.

The family Cercopithecidae comprises two living subfamilies, Cercopithecinae and Colobinae. The former have cheek pouches for the temporary storage of food and a mainly frugivorous-to-omnivorous diet, while the latter have a diet made up of large quantities of mainly young leaves and buds and are characterized by a complex stomach to process this hard-to-digest food. Colobine teeth are also taller and sharper than those of cercopithecines, for better shearing of leaves, and their thumbs are reduced and sometimes completely absent externally. Cercopithecines are quite variable in their environmental tolerance and locomotor adaptations, with terrestrial quadrupedalism having evolved independently several times, and at least twice more among the usually arboreal colobines. They range from desert margins in Arabia and North Africa through savannah, woodland, and rain forest to snowy regions of India and Japan. Most species have some form of multimale social organization, but unimale groups are common among the Cercopithecini. The baboons of sub-Saharan Africa (genus *Papio*) epitomize the terrestrial, omnivorous cercopithecine, with multimale troops involving intermale coalitions. One species ranges over most of the more open regions of the continent, while two species of forest baboons (mandrills and drills) inhabit small areas of western coastal forest. Their Asian equivalents are the macaques (*Macaca*), of which numerous species divide up variable habitats more finely.

authors. Here we recognize Cebidae and Atelidae. Ateloids are characterized by external noses with wide side-facing nostrils, three premolar teeth in both upper and lower jaws, mainly curved nails on fingers and toes, and generally long tails. By contrast, the cercopithecids have a narrower nasal septum with nostrils opening downward, only two premolar teeth, flattened nails, and tails varying in length from long to very short. Within the ateloids, the cebids are characterized by lightly built jaws and teeth, with the third molars reduced (in Cebinae) or lacking (in Callitrichinae); the thumb is often reduced as well, and the nails are clawlike in the callitrichines. Atelids have more robust jaws and zygomatic arches, deep mandibles, and large posterior teeth; one subfamily, the Atelinae, is characterized by a unique prehensile (grasping) tail—an independently evolved and less complex version of this organ is found in the cebines.

All platyrrhines inhabit rain forests or other densely wooded environments, none being at all terrestrial. Diets vary greatly among gums, insects, leaves, and fruits, both soft and hard skinned. In turn, the teeth of ateloids are varied



Savannah baboons (*Papio hamadryas cynocephalus*) in Kenya. The male in the center is grooming a female. Note the size difference between the sexes and the open nature of the terrain. Courtesy of J.F. Oates.



Nilgiri langur (*Semnopithecus* [*Trachypithecus*] *johnii*) in South Indian rain forest, sitting on tree branch on its ischial callosities. Courtesy of J.F. Oates.

Colobines are generally restricted to tropical forest habitats, but at least one living species and several extinct forms inhabited more open woodland or savannah. Unimale groups are common, but multimale troops and even monogamous units are known. The fossil record of the cercopithecids is well documented, with a variety of Asian species and several extinct European and African genera.

See also Ape; Atelidae; Ateloidea; Catarrhini; Cebidae; Cercopithecidae; Cladistics; Colobinae; Diet; Grade; Locomotion; Monophyly; Parapithecidae; Phylogeny; Platyrrhini; Primates; Prosimian; Scala Naturae; Teeth. [E.D.]

Further Readings

- Fleagle, J.G. (1998) *Primate Adaptation and Evolution*, 2nd ed. San Diego: Academic.
- Napier, J.R., and Napier, P.H. (1985) *Natural History of the Primates*. Cambridge, Mass.: MIT Press.
- Szalay, F.S., and Delson, E. (1979) *Evolutionary History of the Primates*. New York: Academic.