Primate Characteristics

• What characteristics define primates?
• What are they an adaptation for?
• What was the likely early primate adaptation?
Traits of Primates

• Emphasis on vision
  • binocular or stereoscopic vision
  • forward facing eyes
  • postorbital bar or post orbital closure
Limbs and locomotion

• Erect posture
• retention of clavicle
• Grasping hands with opposability
• Nails instead of claws
Diet

- Generalized dentition
- Tendency towards omnivory
Senses, brain and behavior

• emphasis on vision
• decreased snout and olfactory areas
• larger and more complex brain
• longer gestation, infancy, life span
• more k-selected (tend towards single offspring)
• greater dependency on learned behavior
• more social
Primate trends

- Arboreal adaptations
- Dietary plasticity
- Behavioral complexity
Primate Evolution and Diversity

- Primates arose as part of the Tertiary mammalian radiation after the dinosaurs went extinct.
- First clear primates identifiable in the fossil record by 50 mya.
- Today about 350 species of primates (compared to, say, 2277 species of Rodentia or 260 species of Carnivora)
Figure 5.2 Geographic Distribution of the Living Primates
Primate body size and shape vary widely from the 440-lb. (200-kg) gorilla to the 2oz. (40-g) mouse lemur.
Living Primates

Figure 5.3 Taxonomy of the Strepsirrhines to the Family Level
Figure 5.5 Taxonomy of the Haplorrhines to the Family Level
Homo sp.
Hominids
Apes
Monkeys
Prosimians
Protoprimates
Paleocene

Distribution of the continents at the end of the Cretaceous
Paleocene

- Infraorder: Plesiadapiformes
- proto-primates
- teeth like primates, otherwise not really
  - no post-orbital bar
  - claws
Tree Shrew
Plesiadapis
Purgatorius
Eocene

• First true primates
• Prosimian “grade”
• Strepsirrhine characteristics
Eocene continents
Strepsirhines

- Lemurs, lorises and galagos
- often used interchangably with Prosimian (difference is placement of the tarsier)
Strepsirrhines

- reliance on olfaction
- often nocturnal (lorises and galagos)
- lack of complex social behavior
- tooth combs
- some claws
Adapis parisiensis


Postcranial adaptations suggest that Adapis used climbing and quadrupedal locomotion similar to extant lorises such as Nycticebus.

http://www.hedweb.com/animimag/slowloris.htm
Adapis
http://fossils.valdosta.edu

Adapis has more upward-facing orbits than extant lemurs, as well as greater orbital convergence than lemurs and indriids, which has led some researchers to suggest that Adapis was very visually oriented. It also was likely diurnal, based on the relatively small orbits.

Also notice the prominent nuchal crest and the moderately short snout characteristic of Adapis.

http://www.laits.utexas.edu/shapiro/index.h
Strepsirhini

- Lemuroidea
  - lemurs and the aye-aye
- Lorisoidae
  - lorises and galagos
Strepsirrhine Distribution
Mouse lemur

Lemurs:
- ONLY on Madagascar
- from really small (<5 inches) to moderate (about 2 feet)
Madagascar
Lemurs:
- both nocturnal and diurnal
- both arboreal and terrestrial
Fat-tailed Dwarf Lemur
Red Ruffed Lemur
Black and White Ruffed Lemur
Golden Bamboo Lemur
Ring-Tailed Lemur

Lemurs:
- both quadrupedal and vertical clingers and leapers (VCL
Vertical Clinging and Leaping
Indri

Lemurs
- scent mark
- diurnal lemurs tend to have more complex social relationships
Aye-aye
Aye-Aye
Aye-Aye hand
Loris

Lorises - Asian and African (Potto)
Galagos - African

- nocturnal
- scent mark
- solitary
- claw
- tapeta lucetum
Slow loris
Pygmy Loris
Potto
Galago

-nocturnal
-VCL
- rat to cat size
Lesser bushbaby
Ida and the Family Tree

The diagram illustrates the evolution of various primate lineages, starting from the Palaeocene era. Key points include:

- **Lemurs**: Branching off early, possibly leading to a lineage that includes humans.
- **Lorises**: Another early branch that diverged from lemurs.
- **Tarsiers**: An early primate group that diverged before the New World and Old World monkeys.
- **New World monkeys**: A lineage that diverged from Old World monkeys and apes.
- **Old World monkeys**: Lineage leading to apes and humans.
- **Afradapis** and **Darwinius**: Specific species highlighted within the evolutionary tree.

The timeline extends from the Palaeocene to the Recent era.
Primate Suborders

- Haplornhini vs. Strepsirhini
- Anthropoid vs. Prosimian
- What are the differences between these two ways of dividing the primates?
Traditional vs. Modern Taxonomy
Haplorhines
While Necrolemur and Tarsius are similar in many cranial features, they also differ in femoral morphology, and their relationship is still very controversial.
Tarsier

Suborder: Haplorhini
Infraorder: Tarsiiformes
Superfamily: Tarsiioidea
Tarsier

- nocturnal
- no rhinarium
- grooming claw
- carnivorous
- monogamous pairs
- no tooth comb
Tarsier Skull