

PRIMATE SUB-ORDER: PROSIMIANS



Are prosimians primitive?

Prosimii means “before apes” or “nearly monkeys”. Prosimians also have features resembling primate fossils from about 50 million years ago and unlike the “higher primates” prosimian skulls have smaller brain cases. All this gives the misconception that prosimians are ancient animals that didn’t keep up with the times. But this is not true. Prosimians are a successful group that remained competitive. They have carved out their own niche and thus play their role in the ecosystem of today.

How are prosimians different from primates?

Prosimians lack many of the typical primate characteristics and Prosimians also behave differently from monkeys and apes. The prosimians are the only primates to rely primarily on smell to find prey and in social behavior. Monkeys, in comparison, tend to be more visually oriented. Prosimians, on the other hand, have more sophisticated detection and interpretation of smells. A good sense of smell requires a larger nose to accommodate a large area of sensitive scent-processing membranes. Thus, Prosimians have relatively long muzzles. These end in a naked, moist snout (rhinarium) which enhances the sense of smell. This is seen clearly in lemurs, which have longer fox-like, wet noses, compared to monkeys which have flatter faces and dry noses.

The larger prosimians are active during the day (e.g., lemurs), while smaller species are nocturnal. These nocturnal species have excellent night vision because they have large eyes relative to their face, and have the tapetum lucidum (except tarsiers). This reflective mirror-like layer at the back of the eye bounces light back to the eye sensors for a second round of processing. It also gives the nocturnal prosimians their typical “glow-in-the-dark” eyes.

Like other nocturnal creatures, these prosimians also have acute hearing with well developed external ears. Especially those which hunt, for they have to be able to detect the slightest movements of their prey in the darkness of the forest night. Their whiskers are also well developed.

All prosimians (except for the tarsier and one generally aberrant species) have a ‘dental comb’ or ‘tooth scraper’ that sets them apart from other primates. This is particularly exaggerated in some species and is made up of the front teeth of the lower jaw (the lower incisors and canines) which are elongated and project forward horizontally and in parallel, like a comb.

Prosimians even have their own toothbrush to go with it, in the form of a horny plate, on which there are tiny teeth, under the tongue, known as the ‘sub-lingula’. This is used for cleaning debris and accumulated bits of hair off the dental comb, which becomes lodged there during grooming. Prosimians use their projecting front teeth for scraping gum off trees and for combing the tangles out of each other’s hair (and their own).

All prosimians also have a “toilet claw” on the second digit of the foot, which helps in keeping their fur in good condition. This is important, particularly for small nocturnal prosimians which rely on their fur to keep them warm. Fur is also a scent dispenser and must be clean to do a good job at perfuming the neighborhood.



How do lorids differ from lemurs?

Lemurs evolved on the island of Madagascar far away from other primates. Lorids (the Loris, Potto, and Galago or bush baby), however, had to compete with larger and smarter monkeys and apes of Africa and Asia. To survive, all lorids are nocturnal, searching for food at night when all of the monkeys and apes were asleep. They are also small, thus able to survive on less food. Most don't rely on fruits. This is probably because they lose out to other fruit eaters; primates during the day and bats at night. Instead, they eat more insects or other plant parts.

The lorids have characteristic nocturnal features. They have huge, round forward-facing eyes and tend to be solitary foragers. Lorises and pottos rely on slow and stealthy movement to catch their living prey and avoid detection by predators. Galagos, on the other hand, are skilled leapers relying on speed to achieve the same ends. As a result of this different approach, lorises and pottos look very different from galagos.

The Potto



In some West African rain forests, as many as five species of prosimians live in the same trees in the same patch of forest. They successfully survive and reproduce without directly competing with each other over resources. Their very different locomotor adaptations influence the way the two groups capture prey, select food, and avoid predators. All of the small bodied, primarily solitary and nocturnal prosimian species like the galago, the loris and the potto, use scent marking to communicate with one another and mark their territories.



Ring-Tailed Lemurs (*Lemur catta*)

Vital Statistics:

Size: head and body 38-45cm, tail 56-62cm, 2.3-3.5kg. Scent glands on feet, backside, wrists and chest. Only males have scent glands on the inside upper arm, and a horny spur over their wrist glands.

Life Span: 18-27 years in the wild, 14 years in captivity

Babies: usually 1 baby, twins when food is plentiful, once a year, births mainly in August, Gestation 136 days, weaned at 3.5-5 months. Females mature 1.5 years, males 2.5 years, but usually don't mate before they are 3 years old.

Social Life: groups of 2-5 as many as 8-16. Females dominate the males; the dominant female leads the group of many males and females.

Distribution: only in Madagascar, southern and southwestern end of the island.

Habitat: rocky, scrubby areas, spiny desert, dry and gallery forests. It ranges further into the interior highlands than any other lemur.

Classification: family Lemuridae. The ring-tail is the best known and best studied of all lemurs.

Tall tails: The ring-tail's most distinctive feature is of course its tail. Tails are important in male rivalry for female attention and for visual communication while travelling on the ground.

During breeding season, the males have vicious "stink fights." Ring-Tails have additional scent glands on their wrist and chest. The males rub the entire stalk along the wrist to coat it with strong-smelling secretions. They then face off, waving their tails held high over themselves and the smelliest tail wins! The tail is also used to balance along a branch and jump from tree to tree. It is *not* prehensile. (not capable of grasping)

Like other large lemurs, they are active mainly during the day, but they are sometimes observed active during night. Although they spend most of their time in trees, of the large lemurs, Ring-tails spend the most time on the ground, as much as 40% of the time. They run well on all four limbs, with their tails held straight up, but they also climb well and move smoothly through the tree tops.

"Devour Ring": Ring-tails eat mostly fruits (70%), primarily wild figs and bananas. Their lower teeth form a comb that is useful in scooping out soft fruit. They also eat a lot of leaves (25%). This is supplemented with flowers, bark, and sap. Occasionally, they indulge in insects and small vertebrates and they regularly forage on the ground for tamarind fruit or grasses and herbs as well making them essentially omnivorous.

Ringleader: The females are extremely dominant and one usually dominates the troop of adult males and females. Reports of group size range from 2-5 to 8-16. Females remain in the troop that they are born in, while males usually leave. Sometimes, males migrate from troop to troop during the mating season. Females prefer to breed with new troop members, thus enhancing gene flow and variation. Males and females have their own hierarchy. Hierarchy within the group is not stable and is not transitive i.e. if A is dominant to B and B is dominant to C, it doesn't mean that A is dominant to C. A daughter is never dominant to her mother. Ring-Tails are territorial but tolerate some overlap with other groups. The females are more territorial, especially during the breeding season, but males also actively maintain the territory with scent markings and calls. Territorial disputes are usually settled by yelling and screaming and rarely involve physical fighting. Their home range is usually larger than most lemurs and they can travel up to 1km a day searching for food. They scent mark their boundaries with urine and their scent glands. The males have fingernail-like spurs on their wrist which they can rub on the inner arm glands (brachial gland) before scratch-marking branches, with an audible "click"!

Ringlets: Like most lemurs, ringtails have only one baby, although twins are common when food is plentiful. Newborns are not blind or naked but still quite helpless (they have blue eyes which turn golden as they grow up). The mother carries her baby in her mouth until it can hold on to get fur by itself. When it's small, it clings onto the mother's tummy. About 2 weeks later, it rides on her back. It takes its first steps away from mother at about 1 month, and is not independent until 6 months. Infant mortality is high and only about 40% reach maturity. Mothers may suckle young other than their own, and orphans from other groups are sometimes adopted.

Holler-Ring: Like other lemurs, Ring-tails have up to 15 different elaborate calls or vocalizations: a cohesion miaow; a loud long plaintive howl by males to advertise their territory which can be heard up to 1km away; an alarm oua-oua by the whole group together; rapid staccato grunts to signal aggression; and high-pitched piercing calls when distressed. Like the Black and White Ruffed Lemur, Ring-tails have different alarm calls for aerial and ground predators. Ring-tails may even purr like a cat when contented.

How do lemurs help the habitat? As they eat fruits and leaves, the large lemurs play an important role in pollinating and dispersing seeds, thus rejuvenating the forest. By dislodging fruits, leaves and flowers as they eat, lemurs also provide food for ground-dwellers.

Status and threats: 1. Ring-tails are considered vulnerable although they breed well in captivity with more than 1000 in zoos around the world, and 10,000-100,000 remain in the wild. This is because they can only survive in primary forests and their preferred gallery forests along rivers and Euphorbia bush are disappearing rapidly due to fires, overgrazing by domestic livestock and tree-cutting for charcoal. They are also hunted for food and frequently collected for pet trade.

Tarsiers (*Tarsiidae*)

Vital Statistics:

Size: Body 8.5-16 cm long, tail 13.5 - 27.5 cm long, 80-165g.

Lifespan: 8-13.5 years

Babies: One baby born. Gestation 178 days (rather long for such a small creature), no specific breeding season, maturity at 1 year.

Distribution: Only in Southeast Asia; Sumatra, Borneo, Sulawesi, and the Phillipines

Habitats: Dense vegetation, usually in lowland rainforest, secondary forests and mangroves. But some, like the western tarsier, can be found in cultivated lands and even gardens.

Classification: Family Tarsiidae, there are 3 species of tarsiers.



General Info: Tarsiers are named for their elongated foot bone (tarsus = foot). They have unique locomotor and life history adaptations and share anatomical and behavioral features with both prosimians and anthropoids, but have had a long, independent evolutionary history.

Big-eyed Tarsiers: Tarsiers have remarkably large eyes. Each eye is bigger than the brain, so much so that they cannot move their eyes within the sockets. Instead, they have special modifications to their neck vertebrae allowing them to rotate their heads nearly 360 degrees (it moves its head 180° in each direction), tracking objects much the same way owls do. Tarsiers could aptly be called the "primate owl." Unlike most other nocturnal creatures, however, tarsiers do not have a reflective layer behind the eyes (tapetum), but they do have a fovea,

which accentuates visual acuity, a feature it shares with the diurnal anthropoids. They also have excellent hearing, using their large funnel-like ears which they can furl and unfurl, and move independently to pick up the faintest forest sounds, especially the movements of their prey.

Leaping Tarsiers: Tarsiers are vertical leapers and clingers and can jump up to 10 times their body length and as far as 3 meters. Their hind legs are disproportionately long, almost twice the body length. Their elongated foot and strong ankle bone act as shock absorbers during their powerful leaps. When they land, they grip strongly with their long and slender fingers and toes, which are tipped with ridged swellings which act like suction cups (in fact, tarsiers can move up glass surfaces with these suckers). The thumb is not opposable but the big toe is.

Their long tail is hairless except for a few hairs at the tip that has ridges underneath it like the ridges on our hands and feet. They use their tails to control rotation during their leaps. They move with great speed to capture prey and leap quickly through the dense vegetation, often twisting in mid-air. On the ground they hop like kangaroos, holding their tails arched over their backs. They are also occasionally quadrupedal when on the ground.

They are brave and fierce hunters, moving actively through dense vegetation during the night. They are not most active at dusk when their prey is most active. They usually hunt about 1m above the ground. During the day, tarsiers move up higher to sleep in dense vegetation clinging to thin branches, propped up by their long, nearly naked tails that they press against the branch. Their fur is thick and silky, helping these tiny creatures to conserve heat while resting and sleeping. Although snakes are a threat to a tiny tarsier, snakes rarely eat *sleeping* tarsiers, the point at which they would be most vulnerable to predation. It is suggested that they reduce their body temperature and thus become “invisible” to snakes that hunt by sensing body heat.

A terror of tarsiers: Tarsiers are usually found in family groups (based on a stable pair bond) or by themselves. They may hunt alone but return to sleep together. They may even rest with their tails intertwined. However, tarsiers prefer to groom themselves and only groom each other during mating season. To groom, they use their toilet claws on their feet, or lick their fur. Tarsiers are highly territorial. The territory of each gender is exclusive, with the male having a larger territory that overlaps those of several females.

The odd ones out; the dry-nosed prosimians: Tarsiers don't fit neatly into either the prosimian or anthropoid suborder. They share characteristics of both suborders, but also have features unique to themselves. Tarsiers are often lumped together with prosimians because they look and act like them: they are small, nocturnal, have a toilet claw, and elongated legs. However, they don't have the dental comb (the fusion of lower incisors and canines in the mandible that forms a “comb-like” structure in the teeth) that many prosimians have. Unlike lemurs and other prosimians, and more like monkeys and apes, tarsiers don't rely as much on smell and have dry noses.

Tarsier Talk: Sound plays a major role in communication for tarsiers. Although tarsiers make less noise than other primates, they do have a wide range of calls. These include a loud piercing single note to announce their whereabouts to other tarsiers, allowing them to avoid each other as they hunt. When contented they make a soft bird-like trill and when being friendly in a group, chirp like locusts. When females are ready to breed, they make a special call. A mated pair also performs duets to strengthen their bonds, and their juvenile offspring may join in. Most of the tarsier's calls are extremely high-pitched and many are beyond human hearing.

Tarsier Babies: Tarsiers breed throughout the year, usually only one baby is born at a time. The gestation period of about 6 months is long for such a tiny creature, but the newborn is quite well developed. It is fully furred, with eyes open and can climb on its first day of birth, make short leaps in four days and begin hunting in about 40 days. Of all primates, a newborn tarsier is the biggest relative to the mother, about 25% her body weight (in humans, this ratio would produce 30 pound babies!). The mother doesn't make a nest for the baby, usually carrying her young with her, but may park her baby in a tree as she hunts. The baby keeps in contact with mum through soft clicks and whistles.



Role in the habitat: Like other hunters, tarsiers help keep populations of their prey under control. They are also food for other creatures high up in the food chain, such as owls, wild cats and snakes. To scare off predators, a tarsier will close its eyes when a predator comes near, then suddenly open its eyes and bare its sharp teeth to surprise the predator when it comes closer. By startling the predator, the tarsier has a better chance to leap to safety.

Status and threats: There are only about 1000 Philippine tarsiers left in the wild. In the 1970s there was a demand for them for science experiments, and as pets or stuffed souvenirs. They make poor pets as they need live food and may die within days of capture due to lack of food. If captured, some become so traumatized by captivity that they kill themselves by banging their heads against the cage.

HIGHER PRIMATES OR ANTHROPOIDS (ANTHROPOIDEA)

Anthropoid means 'human-like' and this group of primates is sometimes called the higher primates. They ended the unchallenged reign of prosimians 45-35 million years ago. Anthropoids were bigger, stronger and more intelligent than the prosimians. If the two groups competed for food or space, the anthropoids invariably won, forcing the prosimians to adapt to a nocturnal way of life.

How are anthropoids different from their more primitive prosimian relatives?

Probably the most significant difference is the dramatic increase in brain size, both in relative and absolute terms, especially the cortex which increased in size and complexity. It is more folded than the smooth surface in other mammals. It is this enlargement which has allowed the primates to make maximum use of their environment and also to develop their characteristic and advanced forms of social behavior. Social structure and behavior patterns have also become complex and varied, especially in advanced species such as the great ape. With increased brain power, it takes longer for their young to learn to live on their own and the anthropoid life span has increased correspondingly.

Other changes in body features include:

The Anthropoid primates exhibit a greater reliance on vision rather than smell. This is reflected in the size of the area of the brain connected with vision, as well as in the positioning of the eyes. With eyes placed forward, they have binocular (stereoscopic) vision. This allows them to judge distances accurately and to focus on objects in front of them without turning their heads to one side. All higher primates have color vision, but don't have the reflective layer in their eyes that enhances night vision (tapetum). Their noses have flattened and became smaller to make room for these large eyes, which were also taking over from long, sensitive nostrils as their most important sense organ. As the use of scent messages gradually decreased, the primates' faces became flatter, with dry, less pointed noses.

Anthropoids are usually larger in body size, have hind limbs and forelimbs of equal length, and have shorter trunks. Using all four legs, they have become expert at jumping from branch to branch and tree to tree. Hands and feet have also changed. Nails replaced claws, leaving room for sensitive pads to develop on the tips of their fingers and toes, and the thumb and big toe became opposable. None of the higher primates have a grooming claw or a toothcomb which are distinguishing features of the prosimians.

New World Monkeys

The tropical forests of South and Central America hold a primatological puzzle: There are no prosimians or apes here, but there is a rich diversity of monkeys quite different from those in Africa and Asia. How these monkeys arrived in the New World is still unclear, but it is thought they were swept away from Africa on a huge raft of floating vegetation that marooned them on the South American continent. These primates would become the platyrrhines, or New World Monkeys. *Platyrrhini* means "flat-nosed," and this is the most obvious distinguishing feature of these primates. New World monkeys

have a wide septum that separates sideways-facing nostrils, in contrast to the downward-facing nostrils and narrow septum of Old World monkeys, apes, and humans. VISUAL Their teeth also differ: most New World Monkeys have a total of 36, which is four more than their Old World cousins, humans included. This is due to two additional premolars in both the upper and lower jaws.

Unlike their Old World counterparts, these monkeys are superbly adapted to an almost exclusive life in the high treetops. Living at such heights, they feed almost entirely on leaves and fruit. An arboreal existence is less complicated than life on the ground. There is ample food and few large predators, aside from larger snakes and some of birds of prey.

Thus, unlike the more terrestrial Old World monkeys, they did not develop marked size differences between the sexes. Males are also far less aggressive. They do not have cheek pouches as they can eat at leisure. They also have furry bottoms (no hard sitting pads). They have long limbs and some have prehensile tails. Some of them have reduced thumbs, so their elongated fingers act as hooks as they swing and leap through the trees. In those with thumbs, they may have limited opposability.

Old World Monkeys

The monkeys of Africa and Asia are the largest and most varied group of primates. They differ from New World monkeys in several ways: their tails are not prehensile; they have 32 teeth, and their nostrils are narrow and point downward---a feature that places them in the primate family tree as *catarrhines* or “narrow noses.”

Unlike the more arboreal New World monkeys, Old World monkeys are adapted to a more terrestrial lifestyle, and therefore, occupy a wider range of habitats, living in virtually every kind of habitat there is on land---from treetops to grasslands and cliffs. They all spend some time on the ground and are predominantly omnivorous, eating a variety of foods, but mostly plants. Unlike the New World monkeys, they are not restricted to tropical and sub-tropical forests, although that is where most of them occur. On both continents, there are monkeys that have adapted to life around human habitations, often raiding crops or rubbish dumps for a living.

Generalists and Specialists. All of the living Old World monkeys are classified under the Cercopithecidae Family. Within this family, however, are two subfamily groups which reflect specific anatomical and behavioral characteristics. The generalists in this family are the “cheek-pouch” monkeys, known as the subfamily Cercopithecinae. The cercopithecine monkeys have pouches in their cheeks to store food (similar to a chipmunk), which guarantees a useful reserve of food. The generalists eat almost anything---seeds, fruit, flowers, roots, insects, and in some cases, small reptiles or birds. In addition to their cheek pouches, the cercopithecine monkeys have another distinctive feature---*ischial callosities*, or sitting pads, which are rough patches of skin on their bottoms.

The specialist Old World monkey species that belong to the subfamily Colobinae are known as the leaf-eating monkeys. They are predominantly arboreal so they don't have cheek pouches as they eat mostly

leaves and so have complex stomachs that help them break down and digest the cellulose (very similar to the specialized stomachs of the ruminants). There are many species of this group found across both Africa and Asia, but most are of limited distribution and adapted to a specific dietary niche. All of them walk and run on their hands and feet. Even the ones that live in trees run along the tops of branches; they never swing along underneath them like spider monkeys. Their forelimbs are generally shorter than the hind limbs.

Howler monkeys

Vital Statistics:

Size: Head and body 56-92cm, tail 59-92cm, 4-10kg. Males often larger, and sometimes the males are black while the females are yellow-brown.

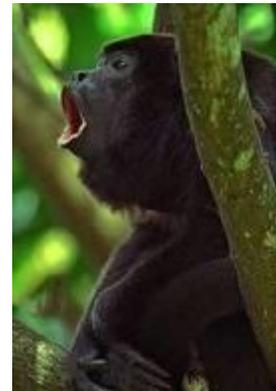
Lifespan: 15-20 years.

Babies: One baby. Gestation 180-194 days, no specific breeding season, females give birth every 2 years, females mature 3-4 years, males at 5 years.

Social life: Groups averaging 3-19 but as many as 45 individuals. Multi-male, multi-female groups led by the dominant male.

Distribution: Only in South America, from Colombia to Venezuela, and Bolivia.

Classification: Family Cebidae. There are 6 species including the Mantled, the Black and the Red.



Howler monkeys are among the largest New World Monkeys and its howl is believed to be the loudest sound of any land animal. Howling by one will trigger howling among other monkeys within earshot, resulting in a deafening chorus. Only males howl and the howler's call can be heard 3km away in dense vegetation, and 5km away in the open. This is achieved by a special bone in its throat (hyoid bone) which amplifies its call. The angle of its lower jaw and the hyoid bone are greatly enlarged. They call in the morning before moving off to forage, occasionally during the day and just before they retire for the night. This helps different howler groups space themselves out and avoid meeting each other in the dense canopy.

They are canopy specialists, eating mainly leaves, supplemented by fruits, insects and other vegetation. They eat the most leaves of all the New World monkeys. Like other arboreal leaf eaters such as the sloth, they have an enlarged intestine with cellulose-digesting bacteria, although they do select young, immature leaves than contain fewer tannins and less cellular fiber so are more easily digested. They are generally inactive, covering only 400m in a day and sleeping 15 hours a day. Despite their poor diet, they are among the most widely distributed primates in South America. The ability to subsist on leaves when fruit is not available gives the howlers more dietary flexibility than other New World monkeys which may account for their increased distribution.

Howler monkeys like other canopy specialists have powerful prehensile tails with a naked underside on the last third portion. They can hang from their tails and can stop their fall by grabbing with their tail. They are also good swimmers.



Social Life: Howlers live in stable social groups averaging 2-19 but as many as 45 individuals. Groups may sometimes combine into larger gatherings of up to 65, but group members spend little time (about 4%) on socializing. The groups comprise 1-4 males and 2-7 females, and sometimes as many as 10 females. Females live peacefully among themselves, but males have a hierarchy. The dominant male leads the groups and decides where the group will

forage. Like lions, when a male takes over a group, he will kill all infants so the females quickly start producing and rearing his offspring instead. It can take two to three years after such episodes to achieve dominance and mate.

Babies: Newborns cling onto their mother's fur and later rides her back for up to a year. 44% of infant mortality is due to infanticide by males.

Status and threats: Some howlers are hunted for food by local tribes and also exported. They are easily located because of their loud calls. They are also threatened by habitat destruction. Habitat fragmentation also leads to reduced troop size which when scattered and separated, make them vulnerable to in-breeding. Some primatologists estimate that howler monkeys could become extinct in our lifetime.

Black Spider Monkey (*Atteles Paniscus*)

Vital Statistics

Size: Male body length 38-48 cm, tail 63-82, 9-10kgs.
Female body length 42-57cm, tail 75-92cm, 6-8kgs.
Males and females look the same.

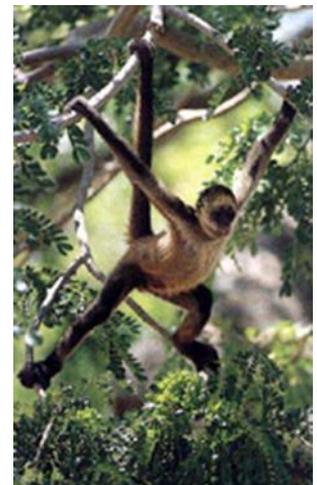
Lifespan: Average 20 years in the wild, 33 years in captivity.

Babies: One young born. Gestation 226-232 days, no specific breeding season, females give birth once every 2-3 years, females mature in 4 years, males in 5 years.

Distribution: Only in South America, north of the Amazon and east of the Rio Negro.

Habitat: The canopy of lowland rainforest to mountain forests. They prefer wet over dry forests.

Classification: Family Cebidae. There are four species of spider monkey found between Mexico and the southern Amazon basin. Besides the black, the others are the **Long-Haired (*A. Belebuth*)**, **Brown-headed (*A. Fuscipes*)** and the **Black-Handed Golden (*A. Geoffryi*)**. But some researchers believe they are all just subspecies of ***A. Paniscus***.



Five-limbed monkey: The spider monkey is aptly named, as its prehensile tail is the most mobile and dexterous of any primate. Spider monkeys are the unrivaled acrobats of the tropical forests of the New World. They move swiftly through the canopy, using their prehensile tails as a fifth limb to navigate through the tree branches. They are good brachiators, using hand over hand, under-branch locomotion similar to that of the small bodied apes, the gibbons. The Spider monkey's arms and legs are particularly long too. It has hooked shaped hands because its thumbs are either absent or reduced to a stump. These, together with its supple shoulder joints allow it to swing quickly under branches (brachiation) without fear of snagging thumbs. Its feet are greatly elongated and their big toe is prehensile, working like hands to grasp thinner branches, as well as for better grip as it walks upright on two legs on broad branches. It may even stand upright on a branch using its tail as a third limb in a tripod arrangement with two legs. Spider monkeys may also leap between trees and branches and on the rare occasions when they move on the ground, they may walk upright on two legs, their long tail held stiffly upright against the back. Spider monkeys are usually all black, but some have flesh colored rings around their eyes and white chin whiskers.

Spider Salad: The spider monkey's diet is made up mainly of ripe canopy fruits (83%). They eat 171 species of fruit, in particular, figs. These monkeys specialize in the upper canopy, rarely foraging 20 meters below the canopy surface. Fruit is supplemented by leaves, flowers, and bark. They also eat birds' eggs, caterpillars and arboreal termites. When feeding, they may hang by their tails and reach out for tidbits with their hands. They can also pick up things with their tails. Spider monkeys are intelligent with a larger brain relative to its body size than any other New World Monkey. When threatened, they may break off branches and throw them at their attackers, some weighing up to 5kgs! They are most active in the early morning.

Tree full of monkeys: The largest aggregations of monkeys are found when a big tree fruits, sometimes up to 100 monkeys. When they feed in a large tree, spider monkeys continuously adjust their positions so they are not too close to one another. Latecomers wait until earlier arrivals leave before entering the tree. It seems that spider monkeys can be quarrelsome feeders if they are too close to one another, and this spacing out saves them all trouble. During those months of the year they have to depend on small, scattered sources of fruit, such as from palm trees, lone individuals and smaller aggregations are found moving through the forest. Thus, they avoid quarrelling at food sources with only enough ripe fruit at any one time to feed a few monkeys.

Social life: Fruits in the rainforest ripen unpredictably and fruiting trees are often widely spread out. Spider monkeys have evolved an extremely flexible society to cope with this. They move around the forest either singly or in groups of up to 20. These groups are not permanent, lasting for a few hours, or sometimes for a few days. Monkeys join or leave these groups, either individually or in smaller groups. This behavior might give the impression that spider monkey society is fluid and unstructured. However, within any one area the monkeys are divided up into groups. A certain patch of forest might have 2 or 3 groups within it, moving around as smaller subgroups



Whenever 2 subgroups meet, their reaction depends on whether they belong to the same permanent group. If they do, they mingle then divide up later, perhaps along different lines. But if they don't, then when the males are within 100m of each other, they will mutually threaten with a great deal of growling at each other. These altercations can easily last for an hour or more but they seem to be strictly male affairs; females remain quietly in the background. Physical violence is relatively rare.

Within the groups, adult males can coexist peacefully, although there is a clear hierarchy determined by age. The group is centered on the females and their young. Males are dominant over females, but it is the females that make the key decisions for the group. Males may forage in small groups while females and offspring often forage alone separately.

Spider seduction: Female spider monkeys actively choose their mates. While some females may choose to mate with several different males in a single day, other female-directed pairings can last up to three days. Black spider monkeys mate face to face, as do gibbons, bonobos, orangutans, capuchins and a few other primate species. A spider monkey baby clings to its mother's tummy for the first four months and later rides piggy-back, wrapping its tail around its mother's tail for additional security. The young are cared for by their mothers and stay near them until they are about four years old.

Spider Talk: These monkeys have a variety of loud calls, audible for 800-100m on the ground and 2000m above the canopy. These "long" calls are used to help the groups space out in the forest and avoid unnecessary confrontations. It is also used to alert members of a group to a central feeding site. Juveniles develop their long calls by trial and error. When they spot a predator on the ground, both males and females make a loud "ook-brack" bark, while throwing branches and shaking tree limbs by jumping up and down. Only males whoop, but when this fails to scare off the intruders, they scatter in smaller groups. Greeting and contact calls sound like horse whinnies. Like other primates, they have a wide range of facial gestures to express their moods. Both sexes sniff and embrace when greeting.

Roles in their habitats: As fruit eaters, spider monkeys are seed predators on about 20 tree species although they may disperse the seeds of more than 135 tree species. They also pollinate some plants as they feed on nectar. Spider monkeys are also a source of food for other tropical forest dwellers. Their main predator is the harpy eagle and they are also hunted as food by local tribes.

Status and threats: For *A. Geoffroyfrontatus* and *A. g. panamensis*, these species are considered good to eat and because of their large body size, spider monkeys have been severely hunted throughout their range. They are easy to locate because they are noisy and travel in big groups which means spider monkeys are often extinct in areas easily accessible to people. They are also affected by habitat destruction, particularly logging, which removes the tall trees that they depend upon. In addition, because the age at which spider monkeys reproduce is quite late compared to other primates of similar body size, and their close to four-year interval between births, their populations have a difficult time recovering if their numbers decline for any reason.

Langur Monkeys

The Asian langurs belong to the family Cercopithecidae and subfamily colobinae. The other major group in the subfamily colobine are the African colobus monkeys; which share similar diets but are found only in Africa. Among these, the best known is probably the Hanuman Langur, considered sacred by the Hindus of India.

The Hanuman Langur (*Semnopitheaus entellus*) is adapted to eating tough food which others find indigestible. They can even eat seeds with high levels of the toxins like strychnine (*Strychnos non-vomica*) and distasteful vegetation avoided by other creatures. They feed mainly on leaves and other vegetation but also search the ground for fallen fruit and nuts. They also snack on insects, fungi and tree gum. They may even eat soil or stones, probably for minerals to help detoxify their food. They are thus found in a wide range of habitats from the plains to forests and is the most terrestrial of the colobine monkeys.

With long strong limbs, the Hanuman Langur runs fast on the ground on all fours, and climbs well and is agile among trees, its long thin tail providing balance. Their horizontal leaps average 3-5m but can reach up to 13m with some loss of height. But it is more nervous on the ground, and will flee to the trees when in danger. They usually only move on the ground when trees are scarce. They forage during the morning and late afternoon. The troop returns to the same sleeping tree every night. They sleep at the ends of branches, where it's hard for a large predator to get at them. Sometimes, they sleep in caves.

VITAL STATISTICS

Size: Head and body 41-78cm, tail 69-1m, 5-23kg. Male is larger than the female.

Lifespan: 20 years in the wild, 25 years in captivity.

Babies: One baby, twins rare. Gestation 190-210 days, breeding season varies with location. Weaned in 10-12 months. Female matures in 3-4 years, male 4-5 years but does not mate until 6-7 years.

Distribution: Only in the Indian subcontinent: Bangladesh, northwest India, southern Himalayas, Sri Lanka.

Habitat: Found in a wide range of habitats from desert edge to rainforest and mountain scrub at 4,000m. Because they are considered sacred there, they are found even near urban areas in northern India.

Classification: They are the only species in the genus *Semnopithecus*. Previously *Presbytis entellus*. It is distinguished from *Presbytis* by its prominent brow ridges.



Social life: Two different social structures have been observed. One with a dominant male and several females, usually found in places where food supply is seasonal; another with many males, usually found where food is abundant. In the groups with several males, the high-ranking males can mate with any females, the other males can only mate when they can sneak by the high-ranking males. These groups can average 13-37 individuals with 2 females to every male, but this can swell to 125 when several groups gather at food rich areas. Females generally remain in their natal group but sometimes, younger males may live by themselves. Males compete aggressively to be the only dominant male in the group. Thus males in such groups rarely hold on to their position for more than 2 years.

Males without females form bachelor groups of 2-32 individuals. Sometimes, bachelor groups can attack the male in the single-male group, working together to drive him out. The highest-ranking male

in the bachelor group then becomes the dominant and chases out the others. With a change in leadership, all male young which are weaned are chased out and infants of both sexes may be killed. In this way, the females come quickly into heat (within 2 weeks) and the male can produce more offspring within his 2-year tenure. Normally, females bear young once every 1-2 years.

Status and threats: Hanuman is the Hindu god of healing and worship and in many parts of India, the Hanuman langur is considered sacred. The Hanuman langur often travels in the company of Indian holy men. Many Hindus leave them undisturbed and even permit them to freely plunder their grain shops. However, this has made the langurs fearless. During food shortages, humans often retaliate. They are also threatened by habitat loss. There are an estimated 230,000 Hanuman langurs left in India.

Baboons (*Papio hamadryus*)

Baboons are only found in Africa. They are the best adapted of all monkeys to a terrestrial way of life. Baboons live in a wide range of habitats, but they require rocky cliffs or tall trees in which to sleep at night and access to water.

Baboons eat a wide variety of food, generally whatever is in abundance. Their diet consists of fruit, seeds, leaves, flowers, roots grass, and small animals. Baboons have relatively long thumbs to dexterously pick and prepare food (peeling, stripping). Like other cercopithecine monkeys, they have cheek pouches in which to store food, allowing them to quickly gather their food and then slowly process it later in a safer and cooler place. Baboons are also known as “dog-faced monkeys” because of their elongated muzzle which have large molars to grind tough food, and very prominent canines in males. Baboons eat a lot more meat than other primates. Mostly these are insects, snails and other invertebrates, but they also eat small mammals if they get the chance. They commonly kill and eat hares, birds, young antelopes and even fellow primates such as bushbabies and young vervet monkeys. Their large size also allows them to overpower and kill, when hunting in a group, larger prey, such as young gazelles.



Baboons are active during the day. Their limbs are well adapted to running fast on all fours in a rocking horse gallop. They walk in an awkward, swaggering manner. Although baboons spend most of their time foraging on the ground, they all retire in trees or high up on steep-sided cliffs to sleep, safe from predators like the leopard. In fact, the availability of safe sleeping sites is the limiting factor to troop size. Because their food is so sparsely distributed, baboons often travel long distances.

Like other old world monkeys, baboons have sitting pads (ischial callosities). They do not have grasping tails, but their tail has a “broken” appearance.

Vital Statistics

Size: Head & body length: 21 ½ - 34 in., weight: 33-62 lbs.; males usually larger than females

Lifespan: up to 45 years

Babies: One baby, twins are rare. Gestation about 6 months, no specific breeding season. Females mature in 4- 5 years, males at 5-7 years.

Distribution: Throughout Africa

Habitat: Gallery forest, rainforest, montane grassland, wooded savanna, scrub

Classification: Family cercopithecidae, subfamily cercopithecinae, genus Papio. There are five species.

Social life

Baboons form large social groups known as troops ranging in size from anywhere from 80 to 500 individuals. Baboon troops tend to have very complex social structures which vary by species. During the day, many troops break up into smaller foraging bands. Within each band are several harems of one male and several females and their young. Males without harems may forage alone or in bachelor groups. When on the move, a baboon troop adopts a well-organized formation with the dominant male in front, followed by the dominant female. Younger males form a flank on either side and bring up the rear, protecting the females and juveniles in the center.

In baboon society, all males are dominant to females. The males in the group compete for rank. High rank is obtained through fighting or by forming alliances with other males. Females have a less obvious hierarchy, but in some, offspring inherit the rank of their mothers. High ranking males have first access to females in season.

**Status and threats**

The Hamadryas baboon was considered sacred by the ancient Egyptians and were allowed to range freely in temples. They were also mummified, and their images carved into temples. Baboons are hunted for their meat, as a pest, and for sport.

APES (*Hominoidae*) The Great Apes and Lesser Apes

How are apes different from monkeys? Most of the differences between apes and monkeys are the result of major adaptations towards a larger brain, greater size, a more upright bodily posture, and having fewer offspring, which take longer to grow up, and thus towards living longer. There is also greater reliance on vision in place of smell.

Big Apes: Apes are the largest primates, with larger bodies than other primates (although they are still one-third the size of humans). All are good climbers, but they are more terrestrial than monkeys, especially the great apes (only the orangutans are fully arboreal). The lesser apes are still very arboreal. Thus, the great apes have a more robust and larger, heavier body with a broad chest. They have a more upright body posture and arms have become more important in movement and are longer than the legs with well-developed forearms. Because of their size, apes tend to hang below branches rather than balance on top of them, as most other arboreal primates do. They have no tail and no hard pads on their rumps for sitting on.

How closely are we related to the apes? Of all the primates, apes resemble humans in many anatomical features even though outwardly they have developed many differences: they are mostly covered in hair, they live in trees and they usually walk on all fours. Apes have dexterous hands, their thumbs and big toes are opposable (whereas humans have lost opposability of the big toe) and all digits have flattened nails.

Genetic evidence linking humans to gorillas and chimps has grown dramatically in the past two decades, especially with the increased use of molecular techniques. It now appears that chimps, gorillas and humans are closely related species. Orangutans are slightly less close, and gibbons are a more distant branch.

Apes rely more on vision than on smell and have a short broad nose rather than a snout, as other Old World monkeys do. They are omnivorous, eating primarily fruit or leaves. All cease foraging shortly before sunset and all apes build fresh sleeping nests every evening.

Smart Apes: The most significant difference is in their brains. These are not only larger but also larger relative to their body size. The complexity of their brains requires them to have longer gestation periods and a late maturity. Gestation periods range from about 210 days for gibbons to 265 days for gorillas. Ape babies are born in a less developed state than monkey babies. They also take longer to grow up, anywhere from 7 to 13 years. Thus, all the apes have long periods of immaturity in which to learn about the world, but they also have long lives (30-50 years) in which to put learning to use. This has enabled them to develop their intelligence to a remarkable degree. Because their young take many years to mature, protective family associations are very pronounced.

The social structure of each ape species is different – orangutans are primarily solitary; gorillas live in troops with one male and many females; chimpanzees live in fission-fusion communities with many males and many females. Their social behaviors are also complex. Facial expressions and complex vocalizations play an important role in communication and in regulating behavior. Their repertoire

includes hoots, growls, roars and even foot stamping and tree bashing to express their moods towards fellow apes or potential enemies. Males are bigger than females: an adult male gorilla or orangutan may weigh twice as much as a female, but the difference is less extreme in chimps and bonobos.

All the great apes are threatened by humans, both directly and by hunting and indirectly through loss of habitat. For all their cleverness, apes are exceedingly vulnerable to extinction as a result of human activity. Because they take a long time to reproduce, their numbers cannot recover quickly from catastrophes.

Classification: The apes or hominoids belong to the suborder Anthropoidea and the infraorder of Old World Monkeys (Catarrhini). Hominoidae is a superfamily within this infraorder, the other superfamily being Cercopithecoidea.

There are 3 main families of apes: Hominidae, which include the 3 species of great apes in Africa today: gorillas (3 subspecies), chimpanzees and bonobos (aka pygmy chimps), and humans; Pongidae, which includes only the orangutan in Sumatra and Borneo; Hylobatidae or lesser apes, which includes the gibbons and siamang of Southeast Asia.

Gibbons



Vital statistics

Geographical Distribution: Southeast Asia, Thailand, Southern China

Habitat: Deciduous monsoon, tropical, and evergreen forests

Diet: Fruit, leaves, flowers, insects

Appearance: Coat color varies according to species & sex

Size: Head & body length is 18-35 in., weight 10-33 lbs.

Life History: Gestation 7 months; sexual maturity for male, 6.5 years, females at 9 years. Life span is up to 44 years.

Behavior: Diurnal, small family groups based around monogamous pair; highly territorial, variety of vocalizations

Are they apes or monkeys?

The lesser apes form the family Hylobatidae which is part of the superfamily of apes (Hominoidea). The term “lesser apes” implies that while gibbons are apes, they did not pursue the same evolutionary line that eventually gave rise to the hominids (bipedal walkers). Lesser apes are like the Great Apes and unlike monkeys and prosimians in the lack of a tail and basic arrangement of teeth. But, they are unlike other apes and like some monkeys in being slender, with longer arms and longer canines and having sitting pads (ischial callosities). They are also the only species of ape that does not build a sleeping nest in the trees. There are also no large differences between males and females, although they may be differently colored (sexual dichromatism).

Best brachiators

Gibbons live in the canopy and rarely descend to the ground. Because they have never had to battle with large predators or compete with other apes on the ground, they remained small and agile. Their

arms are the most exaggerated, and relatively the longest of all primates. These end in long, slender hands that make superb hooks for swinging on branches. The thumb is attached to the wrist instead of the palm. With their extremely long arms and hook-like fingers, gibbons have become superb arboreal acrobats, perfectly adapted for life in the treetops. They travel at great speed through the forest canopy by brachiating---a method of swinging from arm to arm beneath the branches, using their weight to gain momentum like a pendulum. The wrist bones in gibbons have also evolved to aid in this form of locomotion to allow a much greater degree of rotation than in other primates, to the point where the wrist joint has virtually become another ball-and-socket joint like that in the shoulder: a gibbon can spin around beneath a branch almost without its hand moving. Gibbons also leap from branch to branch. When a branch is too thick for their long fingers to hook over, they walk upright on top of it, standing up on two feet with their arms held up for balance.

Singers of the forest

Gibbons are very vocal, known as “singers of the forest,” their calls differ from species to species and between males and females, but gibbons sing to stake out their territory as well as to strengthen the pair bond. All perform a daily morning chorus lasting 15 minutes and carrying up to 2 kilometers away. In some species, only the male sings, while in others, duets sung by mated pairs, and sometimes their offspring, sing together. As the couple matures, the duet becomes more synchronized. Once the duet is finished, the family groups move off to forage, led by the female. Despite their territoriality, lesser apes rarely fight to defend their territory, relying instead on a whole host of theatrics. This includes acrobatic displays, branch breaking and chasing accompanied by loud calls. Groups constantly vocalize to help space themselves out in the dense canopy and avoid accidental meetings



Social Life

All gibbons are monogamous and their social group is based on a mated pair and their offspring averaging 3-4 members. A family may have up to 3-4 juveniles aged 2-3 years apart. Newborns are sparsely furred and the mother cuddles it constantly for warmth. Many gibbon species have babies which are almost white as newborns and take on adult coloring only at 2-4 years of age. Both parents play an active role in bringing up baby. A juvenile stays with the family group until it reaches maturity at 6-8 years. As they near adulthood, the subadults usually leave the group because of the urge to find a mate and sometimes because they are chased out by their parent of the same gender. Subadults without mates roam alone and don't have a territory and it may take several years to find a mate.

Gibbon Ecology

Given that gibbons live primarily in tropical forests and occupy the fruit bearing canopy, the mated pair pattern found among gibbons may help to reduce competition for food. Leaves and flowers make up about a third of the gibbon's diet, but fruit is their primary food source, and are therefore most accurately defined as frugivores. Insects are a vital supplement to the diet as well. Gibbons can be seen hanging from a branch by one hand while gathering fruit and putting it in the mouth with the other. Their relatively small body size enables them to reach the ends of branches, and this niche is where gibbons excel. Studies of gibbon ecology reveal that they play an important role as seed-dispersal agents. One study in Borneo found that they disperse the seeds of 81% of the species they eat and germination trials show that many of these species germinate better after passage through the gut. The gibbon's preference for figs makes them particularly important for the dispersal of the seeds of these

trees, which are important for thousands of insects, birds and other animals, including humans. It follows that the future of biodiverse forests in Southeast Asia is closely tied to the survival of gibbons. Unfortunately, these primates are among the most endangered species on the planet.

The Orangutan: “Person of the Forest”

The Orangutan is the only *Great Ape* to live outside Africa. It is also the most arboreal of the Great Apes. In fact, it is the largest tree dwelling animal (but the Orang is not the largest primate, the Gorilla holds that record). Among the Great Apes, the Orangutans move most efficiently through the trees. Their arms are longer and more powerful than other Great Apes; reaching 2.2 meters across when outspread (longer than the Oran’s height!). In contrast, their legs are short and weak. Too heavy to brachiate, Orangs swing slowly, not letting go of a branch until they reach the next branch. They usually move slowly and deliberately using all four limbs. But Oranugtans can move quickly when suitably motivated: panicked individuals may even leap across small gaps in the trees. They cannot swim. Most descend to the ground only when there is no other way to get to another tree. Then they walk on all fours with clenched fists and not on their knuckles (like gorillas and chimps). Large males, in particular, may be less arboreal because few branches can support their weight.



Sixty percent of their diet consists of fruit, especially figs, but also rambutans, mangosteens, and durians. These are supplemented by bees’ honey, insects and bird eggs. They may also eat soil for minerals. Captive Orangs have been observed to happily eat meat, and in the wild, one was seen eating a dead gibbon. They drink from water collected in tree holes, dipping their hands into the water then sucking the moisture from their hairy wrists.

Orangs forage in the early morning, resting during the midday heat and resuming in the afternoon. Like other Great Apes, Orangs also construct a sleeping nest high up in the trees to rest at night, but only the lighter female and juveniles do this, by weaving a platform out of bent branches. The heavier males usually sleep on the ground. Unlike other Apes, Orangs may also weave a roof over their heads. When it rains or is too hot, they may also hold leafy branches over their heads, or drape large leaves around their head and neck. They make a new nest in a different location every night.

Orangs are highly intelligent, learning what to eat and what not to eat; remembering locations of fruiting trees and when these trees fruit. Orangs show a remarkable ability to arrive at certain trees just as their fruit is ripening. Like other Great Apes, Orangs have been observed to use tools, but less extensively than has been observed for chimpanzees. Orangs use sticks for digging, prying out edible seeds from a spiny fruit case, or use a stick to hit a snake. They may also use sticks to fight each other or scratch themselves. This behavior appears to occur more often when Orangs are found in closer proximity, such as in zoos. Former captives have learned to untie complex knots tying up boats and

rafts, then using these vessels to cross rivers! In the wild, tool use has been observed in Gunung Leuser National Park in Sumatra.

Social Life

The Orangutan is the most solitary of the Great Apes. The longest bond is between mother and offspring. Although juveniles may associate in small groups, adults are usually hostile towards each other, except during mating season. Males and females without offspring travel alone. Their lonely lifestyle is probably due to a relative lack of natural predators (thus there is no need to band together for protection) and due to their food sources which are scattered thinly throughout the rainforest. Because they are such large creatures, they require lots of food, so they forage independently.

Adult males have large territories which they defend from other males. But the home ranges of several males often overlap. To avoid violent disputes, males make their distinctive “long call”, unique to Orangutans. These roars are amplified by the male’s huge throat pouch, which acts as a resonating chamber and produces a booming that can be heard up to 1 km. away. In this way, males can avoid each other. It also tells females where the males are when the females are ready to mate. Orangs have 11-13 other types of calls to convey their moods. The territory of a male usually includes that of up to four females. But males and females do not form pairs. Adult males interact only with females who are in season. Females may forage together in pairs for up to 3 days. Juveniles may also stay together in small mixed male/female groups, or with an adult of either sex.



Reproduction

Orangs have one of the most prolonged development stages of any mammal. A newborn Orang weighs 2 kg and remains totally dependent on its mother for the first 18 months. Like human children, Orang babies have to be taught everything that they need to know to survive. And since males have nothing to do with the female after mating, the mother is the main teacher. The mother even feeds her baby pre-chewed food until it can eat on its own. The baby clings to the mother’s tummy until it is nearly 1 year old and continues to ride on its mother until it is 2.5 years old. A female adult usually establishes a territory near her mother often overlapping with hers. A male will travel far to establish a separate territory.

Orangs have a very low reproductive rate. A female usually has her first infant at 12 to 15 years old and will give birth every 3 to 8 years after that. She will only mate again when her last baby is 3 years old. Even so, her latest offspring may still stay with her after her next baby is born, leaving her only when it is 7 to 10 years old. A male is usually only able to breed successfully at 15 to 20 years old, when they are large enough to compete with rival males, and develop those cheeks that females so adore. Thus it is difficult for Orangutan populations to recover quickly.

Helpful forest friends

As fruit eaters, Orangs help to disperse the seeds of rainforest plants, particularly those with large seeds which other animals cannot swallow. As they drop fruits from the trees as they feed, they provide food

for ground dwellers such as mousedeer. Although very few animals can kill an adult Orang, juveniles and babies are vulnerable to the big cats (leopard), small cats (clouded leopard), and large snakes (pythons). In this way, the Orang is also food to other animals.

Threats

Rapid habitat destruction has caused a precipitous decline in Orangutan populations over the last two decades as rainforests are logged or cleared for agriculture. Orangs are also hunted and killed as a pest on palm oil plantations which are planted on cleared rainforests. An Orang can damage 100 or more palms in one night, by eating the palm hearts. Orang babies are also popular in the pet trade. To get a baby, usually the mother has to be killed. Often, the babies simply waste away. For every single baby that reaches the market, 3-5 babies die. Ironically, Orangs don't make good pets and become too strong and difficult to manage once they reach adolescence. The skulls of dead Orangs are also carved and sold as souvenirs.

Common Chimpanzees (*Pan troglodytes*)

Among the apes, it is the chimpanzees that can tell us most about the natural history of our common ancestor. Chimpanzees are often described as our closest living relative, but there are in fact two species sharing this distinction—the Chimpanzee (once called the Common Chimpanzee) and the Bonobo, or Pygmy Chimpanzee. Both share about 99 percent of their DNA with humans, which means that genetically, they have more in common with us than with gorillas or orangutans. These two species display striking differences in social behavior, giving a valuable insight into the evolution of early hominids.

Chimpanzee playground

Long term studies in the field have revealed that chimp communities are a tangled web of family ties, long lasting friendships and strategic, sometimes short-lived, political alliances. Males form cliques and jostle for social status, but they cooperate in joint endeavors such as hunting or patrolling the boundaries of their territory to scare off strangers from neighboring communities. If such a border patrol comes across a lone stranger, it may attack and in some instances even kill, behavior that can seem chillingly reminiscent of tribal warfare in human societies. On the other hand, chimpanzees can be tolerant and cooperative, and they have been seen to show kindness, compassion and concern for the welfare of others who might or might not be close relatives. Like us, chimpanzees learn the rules of their society and gain experience through play during a long childhood. They remember favors, hold grudges and will gang up with allies to attack a more dominant individual who has, for example, bullied them.

Common Chimp (*Pan troglodytes*) Profile

Distribution: West & Central Africa

Habitat: Humid forest, deciduous woodland or mixed savanna

Diet: Fruit, leaves, flowers, seeds, animal prey (including mammals, birds, ants, termites, wasps, grubs). Chimpanzees hunt & eat other primates, especially colobus monkeys.

Life History: Gestation about 8 months; sexual maturity for males 13 yrs. & females at 11 yrs; life span is up to 50-60 years

Threats: Endangered due to loss of habitat, poaching, hunting for bushmeat, disease from humans, and capture for sale to zoos, laboratories, and pet shops



The Tool User

Chimpanzees use tools to solve a greater range of problems, both in the wild and captivity, than any animal apart from humans. Historically, scientists had viewed tool use as a uniquely human behavior, but when Jane Goodall discovered tool use among wild chimpanzees in the 1960's, her boss, Kenyan anthropologist Dr. Louis Leakey, replied, "Now we must redefine 'tool,' redefine 'Man,' or include chimpanzees with humans." As more field studies were carried out, it became apparent that the kind of tools chimpanzees used varied from place to place. It was found that Gombe Chimps used grass stems and thin wands as a probe to fish for termites, but a mere 125 miles to the south, chimps of the Mahale Mountains did not. They would, however, often use a probe to dip for ants and would then wipe the ants off against their hand to make it easier to eat them. At Gombe, the chimps were only occasionally seen ant-dipping, and they were never seen to use the wiping method for efficiently transferring the biting insects to the mouth. Moreover, young chimpanzees at both sites were seen to closely observe their mother's feeding techniques and then try them for themselves, gradually improving with practice. Clearly, this was cultural transmission of learned behavior down through the generations.

As more scientists spend time observing other chimpanzee populations across Africa, the list of behaviors that might be termed "culture" lengthens and not all of these learned behaviors involve tool use. After detailed comparative studies of chimpanzee communities, it has become apparent that cultural variation did not emerge *after* humans evolved, which used to be the general consensus; instead, it was probably present much earlier in our family tree. The roots of culture, therefore, would seem to date back to the common ancestor of all great apes and humans some 15 million years ago.

Chimpanzee communities

Membership in communities is determined by sex. Males seldom or never leave the community in which they were born, whereas females migrate to a new community upon reaching sexual maturity. Within communities, males tend to form close associations with their maternal brothers. A great deal of time is spent grooming one another to solidify social bonds, but tension is routinely expressed in dominance interactions and when different parties of males meet.

Social relationships are quite complex in chimpanzee society. Males form a dominance hierarchy in which subordinates greet dominant individuals by bobbing or crouching in front of them. Dominant

Tools Used By Chimpanzees

Chewing up leaves to make a sponge and using it to drink rainwater from an inaccessible tree hole

Cracking nuts with rocks (In Ivory Coast and Guinea) or wood (only in Ivory Coast); this behavior has not yet been seen in Central or East Africa, but it has recently been reported in Cameroon

Using a leafy stick as a fly whisk

Using leaves as napkins to clean the body, to dab a wound to inspect bleeding, or to provide a clean surface to inspect or squash an external parasite, such as a louse

Using objects as weapons, including branches as clubs and pieces of wood or rock as aimed projectiles

males commonly approach others with a charging display, running with hair erect, perhaps dragging a branch. Displays are usually done in the context of asserting one's position and testing a subordinate's willingness to challenge. Such assertions of rank and status actually lead to reduced tension within the group because one male has acknowledged the other's competitive superiority. After such displays, a typical sequence is for males to groom each other for several minutes before traveling together.

Males commonly congregate to patrol the border of their community ranges. They will work cooperatively to defend or attack individuals from different communities who might stray into their range.

Bonobos (*Pan paniscus*)

Bonobo (*Pan paniscus*) Profile

Distribution: Central Africa – Democratic Republic of Congo only

Habitat: Humid forest only

Diet: Mostly fruit, but also leaves, flowers and seeds

Life history: Similar to common chimps

Status: Extremely endangered due to logging, illegal poaching, & hunting for bushmeat

The Bonobo, also called the Pygmy or Gracile Chimpanzee, was the last great ape species to be recognized by western science. It was first noted as different from Common Chimpanzees in 1929, then described as a separate species in 1933. Genetic evidence indicates that Chimpanzees and Bonobos diverged between 1.7 and 2.7 million years ago. The most visible distinguishing features are the bonobos' red lips, which contrast with the dark skin of its face, and the central parting of the hair on top of its head. They also tend to have a more slender appearance than the

common chimps and walk bipedally much more frequently than common chimps. This behavioral difference is also apparent in their anatomy, as the bonobo's femur is longer than in the chimpanzee, and its thigh muscles are bigger, making the species appear more human-like.

The "Make Love Not War" Bonobo Society

In addition to their physical distinctions from the common chimps, bonobo society also differs in organization and behaviors. First, bonobos form larger parties of individuals and to remain stable for longer periods than common chimps. Sex ratios are more equal in bonobo communities and females form their own dominance hierarchy. Females bonobos associate more than common chimp females do, and will spend time grooming each other and even rubbing their genital areas together in order to form alliances or gain acceptance into the group. Males too may establish dominance hierarchies, and assert their rank through sexual interactions. There is rarely any violent aggression between members, and any tense situation is usually calmed through sexual activity. Their use of sex to diffuse such situations, forge alliances, and, most importantly occurring beyond and outside of its reproductive context makes the bonobo more like humans in terms of sexual practices than any other primate.

