

African Colobines

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The African colobines, also referred to as the colobus monkeys, are members of the subfamily Colobinae that occur in Africa. They share with the Asian colobines their ability to digest the cellulose and hemicellulose in leaves, using foregut fermentation and symbiotic bacteria in a sacculated stomach. In Asia, however, the colobines evolved to be more diverse, showing a larger variety of species, social organizations, diets, and habitat-use patterns. The African colobines are all arboreal and occupy forested areas. There are three distinct groups of African colobines, the olive colobus, red colobus, and black-and-white colobus, which are sometimes classified into different genera (*Procolobus* (olive), *Piliocolobus* (red), and *Colobus* (black-and-white); Table 1). More conservative taxonomists lump the olive colobus and red colobus together in the genus *Procolobus*, accounting for their closer evolutionary relationship, and maintain the black-and-white colobus in the genus *Colobus*. The stomach is four-chambered in olive and red colobus and three-chambered (lacking the front praesaccus) in black-and white colobus monkeys. There is only a single species of olive colobus, but multiple species of red and black-and-white colobus are usually recognized. The taxonomy of black-and-white colobus is generally not controversial, with five species and several subspecies recognized, while the taxonomy of red colobus is continually debated upon, with a range of one to 16 species recognized (Fashing 2011).

The African colobines are a varied, successful, and wide-ranging group, being found all through the forest belt of Africa, from Zanzibar in the east to Senegal in the west. In the north, colobus are found in the Ethiopian highlands and their distribution extends south to the very edge of the Congo basin. Up to three colobus species may be sympatric (e.g., Taï National Park, Ivory Coast) and populations may be at high densities.

Though they all rely on forested habitats, they are found in many types of forested environments, including moist lowland forests, montane forests, and gallery forests within savannas (Oates 1994).

African colobines show a diverse range of social organizations. Olive and black-and-white colobus are generally found in small groups with one or more males and several females with their offspring. Temporally unstable bachelor groups have been reported in ursine black-and-white colobus (*Colobus vellerosus*) (Saj and Sicotte 2005). Angolan black-and-white colobus (*Colobus angolensis ruwenzorii*) in the mountains of Rwanda are found in large aggregations of up to 300 individuals, and this subspecies shows fluid fission–fusion dynamics at lowland sites (Oates 1994). Red colobus usually live in larger, multi-male groups compared to the other colobus monkeys, averaging 25–50 individuals.

Due to their digestive strategy, colobines are often assumed to be folivorous and most colobus monkeys do eat leaves regularly. However, even though they can digest mature leaves, these do not appear to be favored, and most leaves consumed by colobus are young and easier to digest. Several populations have also been shown to include substantial amounts of fruits, flowers, lichens, or seeds in their diets. Going along with a primarily folivorous diet, colobus activity budgets often include a large amount of resting time each day. Overall patterns show that body size and the proportion of mature leaves in the diet correlate roughly with the mean percentage of resting seen per day (54 percent resting for larger-bodied (average 8.9 kg) *Colobus* populations eating a mean of 14 percent mature leaves, 47 percent resting for *Piliocolobus* populations (average 7.6 kg) eating a mean of 11 percent mature leaves, and 40 percent for smaller-bodied (average 4.5 kg) *Procolobus* populations eating a mean of 6 percent mature leaves) (Fashing 2011).

Colobus monkeys show variable and flexible dispersal patterns. Both sexes are capable of dispersal in all species that have been studied, but dispersal appears to be female-biased in olive and red colobus and male-biased in

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Table 1 African colobine species based on taxonomy in Groves (2007).

<i>Latin name</i>	<i>Common name</i>	<i>Geographic range</i>	<i>Number of subspecies</i>
<i>Colobus angolensis</i>	Angolan colobus	Angola to Kenya	5
<i>C. guereza</i>	Guereza	Cameroon to Kenya	8
<i>C. polykomos</i>	King colobus	Guinea Bissau to Ivory Coast	
<i>C. satanas</i>	Black colobus	Bioko Island, Cameroon, south to Gabon	
<i>C. vellerosus</i>	Ursine colobus	Ivory Coast to Benin	
<i>Piliocolobus badius</i>	Western red colobus	Senegal to Ivory Coast	2
<i>Pi. bouvieri</i>	Bouvier's red colobus	Southern DRC	
<i>Pi. epieni</i>	Delta red colobus	Nigeria	
<i>Pi. foai</i>	Central African red colobus	Southeast DRC to Zambia	
<i>Pi. gordonorum</i>	Udzungwa red colobus	Tanzania	
<i>Pi. kirkii</i>	Zanzibar red colobus	Zanzibar	
<i>Pi. langi</i>	None	Central DRC	
<i>Pi. oustaleti</i>	None	Northeast DRC	
<i>Pi. parmentieri</i>	None	Central DRC	
<i>Pi. pennantii</i>	Pennant's red colobus	Bioko, Equatorial Guinea	
<i>Pi. preussi</i>	Preuss's red colobus	Cameroon	
<i>Pi. rufomitratu</i>	Tana River red colobus	Eastern Kenya	
<i>Pi. semlikiensis</i>	None	Northeast DRC	
<i>Pi. tephrosceles</i>	Ugandan red colobus	Uganda to Tanzania	
<i>Pi. tholloni</i>	Thollon's red colobus	Central DRC	
<i>Pi. waldronae</i>	Miss Waldron's red colobus	Ivory Coast to Ghana	
<i>Procolobus verus</i>	Olive colobus	Sierra Leone to Nigeria	

DRC, Democratic Republic of Congo.

black-and-white colobus. Anthropogenic habitat change and overhunting have affected many colobus populations negatively, especially in West and Central Africa. While olive and black-and-white colobus appear more flexible and able to deal with some degree of habitat disturbance, red colobus species usually do not fare as well. Red colobus are also the preferred prey of chimpanzees in forests where they are sympatric and are easier for humans to hunt than the other colobus, because they are generally found in larger, noisier groups. These factors have driven some species of red colobus to extreme endangerment, and the first primate taxon likely pushed to extinction in historical times is a red colobus subspecies (Miss Waldron's red colobus, *Piliocolobus badius waldroni*) (Gonedel  Bi et al. 2012).

SEE ALSO: Asian Colobines; Diets and Nutrition; Folivory; Sacculated Stomach

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