

Ecology and Behavior of Kudu (Lesser and Greater Kudu) in Africa

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Abstract

Both lesser and greater Kudu are looked very alike in physical appearance, but there are some typical features between them. Their distribution ranges are east, south, central and north-eastern Africa in bushland and woodland habitat types. They are herbivore animals as pure browser and reproduce sexually means. They are active at the early morning and early evening. No fixed breeding season of Kudu, because their breeding season varies due to environmental influence. Currently, Kudu is IUCN red list as near threatened species. The population of two species is declining due to human-induced factors.

Keywords: Distribution; Ecology; Greater kudu; Lesser kudu

Introduction

Lesser and Greater Kudu are sub-species of antelopes that are found in shrubland, woodland, forest, and grassland of the eastern, central and southern part of Africa. Kudu belongs to the genus of *Tragelaphus*. There are two species of Kudu in Africa, which are Lesser Kudu (*Tragelaphus imberbis*) and Greater Kudu (*Tragelaphus strepsiceros*) [1]. Both Lesser and Greater Kudu species look very identical in

physical appearance, but there is some unique feature in which the two species can differentiate one from another. Both Greater Kudu and Lesser Kudu have stripes and spots on the body part, and most have a white hair on the forehead in between the eyes [2]. Male Greater and Lesser Kudu have long and spiral horns. The beautiful horns of Kudus have been used for musical materials, honey bottles and symbolic ceremonial objects. The horns are sometimes used for defense against predators; nor are them an obstruction in wooded habitats type the Kudu inclines the chin up and lays the horns against the back, moving simply through dense bushland (Figure 1) [3].

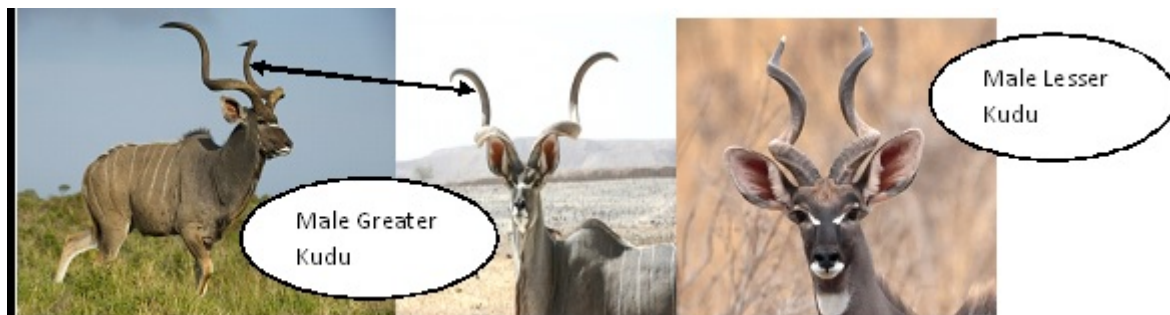


Figure 1: Male Greater and Lesser Kudu horn style.

Female Greater kudus prominently look smaller than that of the males' Greater Kudu without horns. By Physical size contrast, female Lesser Kudus are also smaller with no horns than male Lesser Kudu. Male Lesser Kudus have smaller horns than the Male Greater kudus. Greater Kudu is one of the tallest antelope, with the largest horns and an average length of 120 cm [4]. The Greater Kudu's horns are remarkable and making up to two and half graceful twist. Lesser Kudu has noticeable white patches on the upper and lower parts of the neck. Even if both of two species are bluish-gray, grayish-brown, the Lesser Kudu has five to six more lateral white stripes and a total of eleven to fifteen on the body. Whereas Greater Kudu can have any way between four and twelve stripes. Both species have a crest of long hair and the spinal column while Greater Kudu has a far-flung under the jaw.

Greater Kudus have long legs and narrow body build. Their head appears to have darker color compared to the appearance of their whole body. The males color darkens increase with age increasing and their tail is black tipped with a white underside. Males possess facial hair, but female's lack [1-4]. Lesser Kudus are physically smaller than Greater Kudu. Generally, Greater kudu weighs between 120 kg to 315 kg. Male Greater kudu usually weighs between 190 kg-315 kg [4,5], with the shoulder measuring around 160 cm high. The females weigh between 120 kg-210 kg and the shoulders will measure up 100 cm high [5]. While Lesser Kudu generally weighing between 50 kg to 105 kg [5,6]. Male Lesser Kudus weigh from 60 kg to 105 kg, female weighing between 50 kg to 70 kg (Figure 2) [3,5,7].

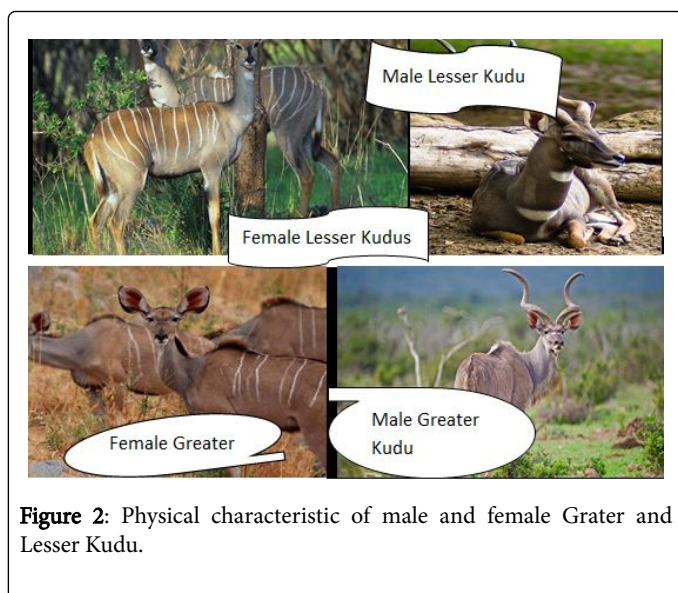


Figure 2: Physical characteristic of male and female Greater and Lesser Kudu.

Both Lesser and Greater Kudus are herbivorous animals, hence they eat various plant species. Their forage can be found in woodland and dense shrubs and feed on different leaves from the trees and bushes. They also feed on other varieties of plant species such as herbs, flowers, berries and fallen fruits [8]. Kudu herds largely consist of female Kudus and their calves. Male Kudus mostly tend to be solitary and only come together at the time of mating [6,9]. The Kudu gestation period is generally around 8 months. However, the baby Kudus tend to be born in places that vary in the place of habitation and climatic conditions when there is plenty of food available to help the Kudu young to grow [7,9]. Humans find the Kudu species an easy mark for hunting due to their tendency to stop and look around after they have run away. Some local people believe that the Kudu should be a sacred animal and therefore should be protected rather than killed. Both Lesser and Greater Kudus are related to another genus of *Tragelaphus* like Mountain Nyala (*Tragelaphus buxtoni*), Sitatunga (*Tragelaphus spekei*), Nyala (*Tragelaphus angasi*) and Bushbuck (*Tragelaphus scriptus*) [10]. This review paper was aimed to describe the behavior, ecology and population status of Lesser and Greater Kudus.

Taxonomy and Genetics of Kudu

The scientific classification of Kudus is: Kingdom Animalia, Phylum Chordata, Class Mammalia, Order Artiodactyla, Family Bovidae, Subfamily Bovinae, Genus *Tragelaphus* [11]. The scientific name of the Lesser Kudu is *Tragelaphus imberbis*; first described by the English zoologist Edward Blyth in 1869 [11], while the Greater Kudu's scientific name is *Tragelaphus strepsiceros*. Male Greater Kudus have 31 chromosomes; females have 32 chromosomes. This discrepancy/difference is due to a translocation between an autosome and the Y-chromosome [12]. While the Lesser Kudu has 38 chromosomes in both female and male and is remarkable because of its fusion chromosome, both X and Y-chromosomes have compound fusions, and they are with the same autosome. There is a "pedigree" of possible developments over time. The translocation in both sex chromosomes contrasts with that of many other African ungulates that have only an X/A translocation but possess a normal Y-chromosome. These species thus

have different numbers in males and females. Other views of evolutionary relationships, resulting from mtDNA [12].

Ecology and Behavior

The hierarchy among male Kudus is generally determined by physical size and age. The same size and age of male Kudus involve infighting contests in which they approach one another slowly, without horns; push back and forth until one hesitates. Commonly, no serious damages result, but remains of animals have been found where the two fighters had locked horns in such a way that they could not be free. Their dominance is quickly and peacefully determined by a lateral display in which one male stands sideways in front of the other and makes himself look as large as possible. If the other Kudu is properly overwhelmed, dominance is formed. Occasionally, males form small bachelor groups, but more commonly, they are solitary and widely isolated. Greater Kudus are more dependent on water sources as compared to the Lesser Kudu [3]. The pregnant female Kudu leaves the group to give birth, departing the newborn lying out for 4 or 5 weeks. The calf then begins to complement its mother for 3 to 4 months. Young Kudus grow quickly and become independent of their mothers at 6 months [1,7]. Their hidden coloring and markings protect Kudus by camouflaging them. If alarmed, they usually stand still and are very difficult to spot. Kudus normally restrict their activities to a small home range, but the shortage of food in the dry season may prompt them to travel more widely. Greater Kudus generally feed and drink in the early morning and late afternoon, acquiring water from waterholes or roots and bulbs, which have high water content [9]. They reach sexual maturity between 1 to 3 years. The mating season occurs at the end of the rainy season, which may vary slightly according to the place of habitation and climate. Before mating, they celebrate a courtship behavior; the male stands in front of the female and often engages in a neck wrestle. Then the male follows the female while issuing a low-pitched call until the female allows him to copulate. Gestation period takes around eight months [8-10]. Greater Kudus tend to bear one calf, though rarely may be two. The calf will wait with the mother to feed it, but later it will become more demanding of milk, and after a few months even aggressive. For the first two weeks, a calf hides where predators cannot find them. For four to five weeks, they journey with the herd only during day time. Males become self-supporting at 6 months old whereas females around 1 to 2 years. The life span of Greater Kudus may be up to 20 years in captivity [3,9]. Female Greater Kudus live with six to twenty individuals including their calves. Though males tend to be largely solitary, they sometimes form bachelor herds that consist of 4 to 8 calves. Rarely will a herd reach up to forty individuals, sometimes may be difficult for large groups. A herd's area can embrace 6.1 km², and spend an average of 54% of the day foraging for food [3]. The Greater Kudu is similar with the Lesser Kudu in group structure, nevertheless, groups are apparently somewhat larger. But their social organization may be similar to the Lesser Kudu, but probably subject to more pronounced seasonal variations in the many parts of the species' range (Figure 3) [10]. Adult males will often fight with other males by intertwining their horns with the other until one of them admits defeat and gives in. In the occasional situation, both males being incapable of freeing themselves from the other's horns, frequently resulting in the death of both animals. Females may sometimes ward off males by biting them, due to their lack of horns [9].

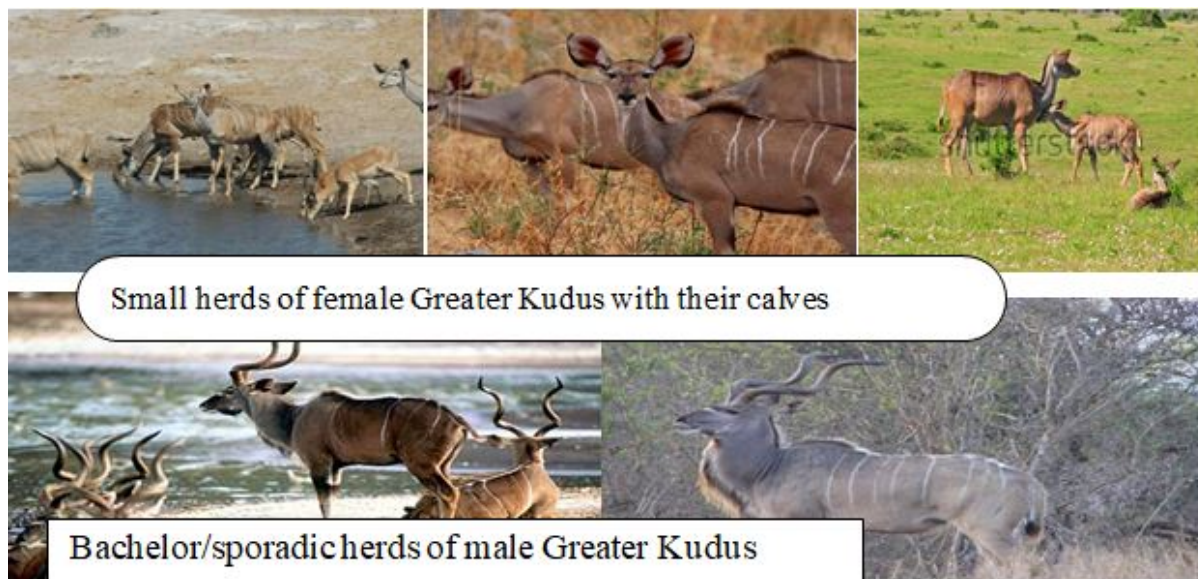


Figure 3: Group size of Greater Kudu.

Lesser Kudu is generally active early morning and late afternoon and seeks dense cover when at the hot time. They seem to travel independent of water sources, nevertheless normally found in waterless deserts. Lesser Kudu is generally found at altitudes range 1,200 m to 1,740 m [11]. Females form groups of 2 to 3 while males tend to solitary or occasionally may form small groups (Figure 4). They are no territorial behavior animal. Their movement is usually bounding leaps with exceeding 2 meters and traversing over 9.2 meters [3,8,9]. Before they leave and travel lonely or forming a small sporadic male group, the young male stays with their mother for 1.5-2.0 years. Kudu reproduces sexually, however, there is no fixed breeding season for lesser kudu. They become sexually mature at 1.25-1.50 years; however, males do not gain social status to reproduce until reach 4-5 years old [7,8]. Males perform a shoving match, they press their heads and horns together and try to force their horns down onto the nape of their opponent. Males and females also perform a superiority contest, where they stand fully erect on their hind legs and attempt to push each other over. When the males mount, they lay their neck and head down and onto the females back. All female Lesser Kudu has its own independent estrus cycle and is anestrus for only a couple of weeks. The gestation period ranges from 7.5 to 8.0 months. They only one offspring is produced, weighing 4.0 kg-7.5 kg. The 50% of the calves die within the first six months, by disease and predation, and only 25% survive to reach 3 years old. Males begin horn growth after the first 6-9 months and reach full length after 3 years. The Lesser Kudu may live up to 10 years in the wild and 15 years in captivity [2,8].

In most cases, the proximate factor influencing the social organization of Lesser Kudu appears to be the available food and water supply. If food is scarce or seasonally limited, home ranges must be larger or shifted seasonally, leading to movements and migrations. Group size and composition, too, may vary locally and or seasonally. In a habitat with the scarce or erratic food supply, the flexibility of the social organization is vital to survival [2].

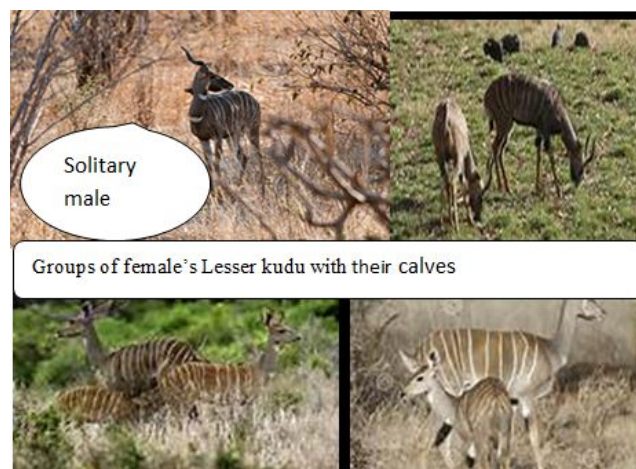


Figure 4: Groups size of female and male Lesser Kudu.

One aspect of environmental influences on the social organization is closely linked to reproduction, especially its seasonal distribution. In tropical areas, this may take one of three forms: (1) strictly seasonal, i.e. breeding limited to a particular, usually fairly short period of the year; (2) partly seasonal, i.e. breeding throughout the year but with seasonal peaks; (3) non-seasonal, i.e. breeding more or less continuous the year around (Chris and Stuart). The environmental agents responsible for a particular breeding pattern, and the ways in which they act are not yet fully understood. On occasions, strictly and partly seasonal breeders share the same habitat in which species with non-seasonal reproduction may occur as well. The social organization of any species can be considered as a system providing a framework within which reproduction can take an orderly course. In seasonal breeders, it is best defined during the mating season, but need not, break down or be replaced by some other system at other times.

Distribution and habitat of kudu

The Greater Kudu distribution ranges from the east; Ethiopia, Sudan, Somalia, Eritrea, Tanzania, and Kenya; from south Zambia, Angola, Namibia, Botswana, Zimbabwe, and South Africa and from the northern Central Africa Chad. They inhabitant in thick bush-land, rocky hillsides, and dry riverbeds and anywhere with a constant supply of water [12-15]. Greater Kudus can found in wood and bushlands area. Greater Kudu is considered as the most handsome of the tragelaphine antelopes, which includes the Bongo, Eland, Nyala, Bushbuck, and Sitatunga [8,11,14]. The geographical distribution of Lesser Kudu, in northern East Africa, including Ethiopia, Kenya, Somalia, South Sudan, Tanzania, and Uganda. It is extinct from Djibouti. The subspecies displayed at the Zoo originates from Kenya, South Sudan, southern Somalia, and Tanzania. Due to a shyness, rarely found in open habitat types, and prefers dry, flat, and densely thicketed areas in the tropics and sub-tropics. Can also be found in woodland and hilly areas. Lesser Kudus are also inhabiting in acacia and Commiphora thorn bush in arid savannas; they rely on thickets for security and are rarely found in open or scattered bush. It is associated with thorn bush in semi-arid areas of northeastern Africa. They may not found in open areas and long grass area, preferring in shaded areas with short grasses instead. Generally, the individual home ranges from 0.4-6.7 km², while males have an average home range size of 2.2 km² and those of females 1.8 km² [8].

Feeding habit of Kudu

Both Lesser and Greater Kudu are planted browser animals. They eat leaves and shoots from a variety of plants species. During dry seasons, they eat wild watermelons and other types of fruit. Lesser Kudu is less dependent on water sources than the Greater Kudu. Where farming has developed near their habitat, Greater Kudus occasionally intended in nocturnal visits to plantations and vegetable plots [12-14]. Forbs form the preferred dietary component of Greater Kudus, especially creepers, this seems to be associated both with the relatively high nutrient content so their leaves and with the less fibrous nature of their stem material compared with trees and shrubs. Woody browse is most sought during the early growing season when their new shoots are softest, and also when forbs are least available fruits and pods form an important nutrient-rich supplement certain times of the year [2,8]. Lesser Kudu eats a wide variety of plants, in some areas up to 150 different species. Its diet includes leaves, shoots, twigs, grass, fruit, and herbs. Rarely drinks water, and seems to get all the moisture necessary from its food, enabling the species to survive in arid and semi-arid areas.

Predators

Lions, leopards, wild dogs, and spotted hyenas are predators for both Lesser and Greater Kudu; cheetahs, smaller cats, eagles, and pythons also can prey on the young Kudu [9-12]. Their numbers are also declined due to human hunting them for their meat, hides, and horns [13].

Threats and Population Status

Threats

Lesser and Greater Kudu populations are affected by human hunting for their hides, meat, and horns. People destroy Kudu's habitats for agricultural expansion and charcoal burning [11]. They are

highly vulnerable to the rinderpest virus. Many scholars indicated recurring epidemics of the disease have reduced Kudu populations in East part of Africa [14]. They are also highly susceptible to rabies disease in times of prolonged drought.

The Kudu faces mild, but long-term population decline due to several factors. They are commonly hunted for both bushmeat (wild animal meat) and sport. However, their preferred dense scrub habitat and shy habits provide some resistance to hunting efforts overgrazing and encroachment from human farmers degrades the Kudu's habitat since Kudu will not survive in open fields or farmland [3].

Population status

Greater and Lesser Kudu are IUCN red list as near threatened species [11]. The total population of Greater Kudu at about 482,000 [16-19]. It is considerably less than the real total population of the Greater Kudu because estimation by aerial counts tends to substantially underestimate this species' actual numbers. The average densities of 1.0 per km² Greater Kudu support where the species is known to be common and 0.05 per km² elsewhere. Even though the population status of Greater Kudu is generally stable or increasing on private land, and in protected areas of Southern and south-central Africa and Tanzania, the tendency to decline in most other regions. The high individual numbers of Greater Kudu on private land show its value as one of Africa's major trophy animals. Hence, the safari hunting industry is very vital for ensuring the continued existence of a large population of Greater Kudu on private land. The trends of the northern populations are risky, and their survival will depend on more effective protection and management in game reserves, national parks, and hunting concessions. The total population of Lesser Kudu is at about 118,000, of which one-third or 33% are found in protected areas. The population density estimates of 0.05-1.0 per km² within areas of favorable habitat. Although Lesser Kudu has a capacity to survive in the face of overhunting, its population size is perhaps in gradual decline over extensive areas of its range due to human settlement. Generally, their population number is declining in much of the range, as a result of illegal hunting, overgrazing, and outbreaks of rinderpest disease. Moreover, long-term population decline overcame due to hunting for their meat and pastoralism increase within its remaining range. The population status may eventually decline to threatened species in the near future [20].

Conclusion

There are two species of Kudu in Africa, which are Lesser and Greater Kudu. Both Lesser and Greater Kudu are sub-species of antelopes; belongs to the genus of *Tragelaphus*. They are closely relating to each other and look very alike in physical appearance, however, there are a few unique characteristics that can be differentiated from one another. Both two species of Kudus are herbivorous animals; browse and eat leaves and shoots from various plant species. They are active in early morning and late afternoon. They reproduce sexually and their mating season occurs at the end of the rainy season, which can vary slightly according to the area and climate condition and they are also not territorialism animals. Their gestation period ranges from 7.5 to 8.0 months. Lesser and Greater Kudus can found in drier areas of eastern, southern and central Africa. Lesser and Greater Kudus are mostly inhabited in woodlands and bushlands habitats. Lesser and Greater Kudu are IUCN red list as near threatened species. However, their status may gradually decline to threatened

species in the near future as a consequence of illegal hunting, overgrazing, habitat loss and eruptions of rinderpest disease.

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