

= Nyala =

The nyala (*Tragelaphus angasii*), also called inyala , is a spiral @-@ horned antelope native to southern Africa . It is a species of the family Bovidae and genus Nyala , also considered to be in the genus *Tragelaphus* . It was first described in 1849 by George French Angas . The body length is 135 ? 195 cm (53 ? 77 in) , and it weighs 55 ? 140 kg (121 ? 309 lb) . The coat is rusty or rufous brown in females and juveniles , but grows a dark brown or slate grey , often tinged with blue , in adult males . Females and young males have ten or more white stripes on their sides . Only males have horns , 60 ? 83 cm (24 ? 33 in) long and yellow @-@ tipped . It exhibits the highest sexual dimorphism among the spiral @-@ horned antelopes .

The nyala is mainly active in the early morning and the late afternoon . It generally browses during the day if temperatures are 20 ? 30 ° C (68 ? 86 ° F) and during the night in the rainy season . As a herbivore , the nyala feeds upon foliage , fruits and grasses , with sufficient fresh water . A shy animal , it prefers water holes rather than open spaces . The nyala does not show signs of territoriality , and individuals areas can overlap each others . They are very cautious creatures . Old males live alone , but single sex or mixed family groups of up to 10 individuals can be found . These inhabit thickets within dense and dry savanna woodlands . The main predators of the nyala are lion , leopard and Cape hunting dog , while baboons and raptorial birds hunt for the juveniles . Mating peaks during spring and autumn . Males and females are sexually mature at 18 and 11 ? 12 months of age respectively , though they are socially immature until five years old . After a gestational period of seven months , a single calf is born .

The nyala 's range includes Malawi , Mozambique , South Africa , Swaziland , and Zimbabwe . It has been introduced to Botswana and Namibia , and reintroduced to Swaziland , where it had been extinct since the 1950s . Its population is stable and it has been listed as of Least Concern by the International Union for Conservation of Nature (IUCN) . The principal threats to the species are poaching and habitat loss resulting from human settlement . The males are highly prized as game animals in Africa .

= = Taxonomy and naming = =

The nyala was first described by George French Angas , an English naturalist , in 1849 . The scientific name of nyala is *Tragelaphus angasii* . The name *angasii* is attributed to Angas , who said that Mr. Gray had named this species after Angas ' father , George Fife Angas , Esq. of South Australia . But , according to Article 50 @.@ 1 @.@ 1 of the International Code of Zoological Nomenclature and International Commission on Zoological Nomenclature , this is insufficient to state Gray as the author . The name " nyala " is the Swahili name for this antelope , which itself comes from the Zulu " inyala " . Its first known use was in 1899 . The word has a Bantu origin , similar to the Venda word *dzi @-@ nyálà* (nyala buck) .

The nyala is the second taxon to branch off from the tragelaphine family tree just after the lesser kudu . As the nyala line has remained separate for a considerable amount of time (over 5 million years) , it has now been placed in its own monotypic genus *Nyala* . *Nyala* was proposed in 1912 by American zoologist Edmund Heller , the one who had also proposed *Ammelaphus* (lesser kudu) . but not widely recognized , and was only re @-@ established as a valid genus in 2011 by Peter Grubb and Colin Groves . While *Nyala* is the accepted genus , it is still considered as a species of *Tragelaphus* .

In 2005 , Sandi Willows @-@ Munro (of the University of KwaZulu @-@ Natal) and colleagues carried out a mitochondrial analysis of the nine *Tragelaphus* species. mtDNA and nDNA data were compared . The results showed that the tribe Tragelaphini is monophyletic with the lesser kudu (*T. imberbis*) basal in the phylogeny , followed by the nyala . On the basis of mitochondrial data , studies have estimated that the lesser kudu separated from its sister clade around 13 @.@ 7 million years ago . On the other hand , the nuclear data shows that lesser kudu and nyala form a clade , and collectively separated from the sister clade 13 @.@ 8 million years ago .

== Genetics and evolution ==

The nyala has 55 male chromosomes and 56 female chromosomes . The Y chromosome has been translocated onto the 14th chromosome , as in other tragelaphids , but no inversion of the Y chromosome occurs . Cranial studies have shown that the mountain nyala and nyala , though sharing a common name , are actually distant relatives .

Fossil evidence suggests that the nyala has been a separate species since the end of the Miocene (5 @. @ 8 million years ago) . Genetic evidence suggests that the proto @-@ nyala had some early hybridization with the proto @-@ lesser kudu , but the two have remained separate long after this crossing .

== Physical description ==

The nyala is a spiral @-@ horned and middle @-@ sized antelope , between a bushbuck and a kudu . It is considered the most sexually dimorphic antelope . The nyala is typically between 135 ? 195 cm (53 ? 77 in) in head @-@ and @-@ body length . The male stands up to 110 cm (43 in) , the female is up to 90 cm (3 @. @ 0 ft) tall . Males weigh 98 ? 125 kg (216 ? 276 lb) , while females weigh 55 ? 68 kg (121 ? 150 lb) . Life expectancy of the nyala is about 19 years .

The coat is rusty or rufous brown in females and juveniles . But it grows a dark brown or slate grey in adult males , often with a bluish tinge . Females and young males have ten or more white vertical stripes on their sides . Other markings are visible on the face , throat , flanks and thighs . Stripes are very reduced or absent in older males . Both males and females have a white chevron between their eyes , and a 40 ? 55 cm (16 ? 22 in) long bushy tail white underside . Both sexes have a dorsal crest of hair running right from the back of the head to the end of the tail . Males have another line of hair along the midline of their chest and belly .

Only the males have horns . Horns are 60 ? 83 cm (24 ? 33 in) long and yellow @-@ tipped . There are one or two twists . The spoor is similar to that of the bushbuck , but larger . It is 5 ? 6 cm (2 @. @ 0 ? 2 @. @ 4 in) long . The feces resemble round to spherical pellets . The nyala has hairy glands on its feet , which leave their scent wherever it walks .

The condition of the nyala often varies between the sexes . According to a study , this can be attributed to the differences in their body sizes . It was noted that during nutritional stress , old adults died in more numbers , of which most were males . During an attempt of blood sampling in the nyala , it was found that Vitamin E levels varied during stress .

== Parasites ==

A study of the helminths from 77 nyalas from four game reserves in Natal revealed the presence of ten nematode species and four nematode genera , a trematode species and paramphistomes (members of superfamily Paramphistomoidea) , and two cestode genera . The research discovered new parasites that the nyala was host of - namely a *Cooperia rotundispiculum* race , *Gaigeria pachyscelis* , a *Gongylonema* species , *Haemonchus vegliai* , *Impalalia tuberculata* , an *Oesophagostomum* species , a *Setaria* species , *Trichostrongylus deflexus* , *Trichostrongylus falculatus* , the larval stage of a *Taenia* species , a *Thysaniezia* species and *Schistosoma mattheei* . *Ostertagia harrisi* and *C. rotundispiculum* were the most dominant nematodes in the antelope .

Another study of 97 blood samples of South African nyalas revealed the presence of tick @-@ borne hemoparasites (blood parasites) . The methods used were polymerase chain reaction (PCR) and reverse line blot (RLB) hybridization . The dominant parasites were *Theileria* species , *T. buffeli* , *T. bicornis* , *Ehrlichia* species , *Anaplasma marginale* and *A. bovis* . Ten tick species , two louse species and a louse fly species were recovered in a study of 73 nyalas at Umfolozi , Mkuzi and Ndumu Game Reserves in northeastern KwaZulu @-@ Natal in 1983 and 1984 and an additional six individuals in 1994 . It was found that nyalas were hosts to all stages of development in *Boophilus decoloratus* , *Rhipicephalus appendiculatus* and *R. muelhensi* and the immature stages of *Amblyomma hebraeum* and *Rhipicephalus maculatus* . Adult males served hosts to more number

of ticks and lice than adult females did . Also , a trypanosome was isolated from a nyala , wild @-@ caught in Mozambique , which was diagnosed and found as akin to *Trypanosoma vivax* , based on biological , morphological and molecular data .

= = Diseases = =

The nyala can also suffer from myopathy . In between January 1973 and June 1981 , 21 nyalas succumbed to the disease . The main symptoms were stiffness , inability to rise , and failure to suckle in newborns . Necrosis (that is , the premature death of cells in a living tissue) and mineralization were found in the skeletal muscle after a histological analysis . In the juveniles there was acute necrosis of the cardiac muscle . In adults , there was interstitial fibrosis of the cardiac muscle , along with arteriosclerosis .

In a report published in 1994 entitled " Epidemiological observations on spongiform encephalopathies in captive wild animals in the British Isles " it was noted that spongiform encephalopathy (BSE) had been diagnosed in one nyala captive in a zoo . The nyala was formerly affected by the disease rinderpest , although the viral disease is considered eradicated now .

= = Ecology and behavior = =

The nyala is active mainly in the early morning and late afternoon . It browses during the day if temperatures are 20 ? 30 ° C (68 ? 86 ° F) and during the night in rainy season . These antelopes rest in thick bushes during the hot hours of the day . The nyala is very shy and cautious in nature , and like remaining hidden rather than coming out in the open . Most sightings of the nyala in the wild are at water holes . But now @-@ a @-@ days they are becoming less shy and often come out in the sight of tourists .

Nyala groups are according to sex or mixed . Herds usually browse and drink water together . Each group consists of two to ten individuals . A study in Zinave National Park at Mozambique showed that 67 % of the observations were of groups of one to three nyalas , and the rest of the herds consisted of up to 30 nyalas . It was also seen that herds often broke up and formed again . Generally adult males remain alone . Females often remain near their mothers when they have their offspring , so the relationships in female herds may be considered relatively closer than that of males .

Alert and wary in nature , the nyala use a sharp , high , dog @-@ like bark to warn others in a group about danger . This feature is mainly used by females . They also react to the alarm calls of impala , baboon and kudu . The impala has been found to react to the calls of the nyala too . The main predators of nyala are lion , leopard and Cape hunting dog , while baboons and raptorial birds are the predators of juveniles .

= = = Diet = = =

As a herbivore , the nyala 's diet consists of foliage , fruits , flowers and twigs . During the rainy season they feed upon the fresh grass . They need a regular intake of water , and thus choose places with a water source nearby . However , they are adapted to live in areas with only a seasonal availability of water . A study in Zululand showed that the nyala fed mainly in the early morning and the late afternoon . They feed at night during the rainy season .

A study made in Mkhuze Game Reserve and Ndumu Game Reserve in Natal , focused on the dietary habits of the impala and the nyala , showed that the amount of dicotyledons in their diets varied seasonally . In the diet of nyala its content was 83 @.@ 2 % and impala 's diet contained a lesser figure of 52 % dicotyledons . The diet grew richer in fiber content and dietary proteins were less . The reverse occurred in the rainy season . As the rainy season arrived , both the species took to a diet of mainly monocotyledons , and the impala consumed more of them . The diet contained more proteins than fibers .

Another study was done to find whether the sexual dimorphism in the nyala influenced its foraging

habits . Vegetation surveys were conducted with the end of each feeding bout . It was found that females spent equal periods of time foraging in all the three habitats , but males preferred sand forest more . More differences were noted , as males ate woody species at a greater average height whereas females fed from the low herbaceous layer . It was concluded that the differences resulted from varying nutritional and energetic demands according to their diverse body sizes and differing reproductive strategies .

= = = Reproduction = = =

The nyala breeds throughout the year , but mating peaks in spring and autumn . The reason for this is still unknown , but attributed to the photoperiod and the feeding habits of the animal . Females reach sexual maturity at 11 to 12 months of age and males at 18 months (though they are socially immature until five years old) . Once sexually mature , a male 's seminiferous tubules begin spermatogenesis , that is , the generation of sperm . In a study , males over 14 months old showed active spermatogenesis .

Before ovulation , the Graafian follicles reach a length of at least 6 @. @ 7 cm (2 @. @ 6 in) . A female 's estrus cycle is about 19 days long . Males mate with the female for two days of the cycle , but she allows it for only six hours per cycle . When the male enters a females ' herd during mating , he makes a display by raising his white dorsal crest , lowering his horns and moving stiffly . As in many other animals , the males fight over dominance during mating .

In a study , the Kidney Fat Indices (KFIs) of impalas and nyalas were studied to understand the influence of social class and reproduction on them . Kidney Fat Index is a technique in which the kidney is removed and weighed with the fat and once again excluding the fat . The resultant difference is the amount of fat on the kidney . The more the fat , the healthier the animal . In rut , the male nyalas had less KFIs , that did not vary much with the season . Pregnant females , both the antelopes nyala and impala , had higher KFIs than the non @- @ pregnant ones .

There is a significant increase in corpus luteum in the last third of gestation . Gestation is of seven months . A single calf is born , weighing 5 kg (11 lb) . Birth takes place generally away from the sight of predators , in places such as a thicket . The calf remains hidden for up to 18 days , and the mother nurses it at regular intervals . The calf remains with its mother until the birth of the next calf , during which males in rut drive it away from the mother .

= = Habitat and distribution = =

The nyala inhabits dense lowland woodlands and thickets , mainly in southern Malawi , Mozambique , Zimbabwe , and eastern South Africa . It chooses places with good quality grasslands as well as provision of fresh water . They also inhabit lush green river country . The nyala 's natural range stretches across southeast Africa from the Lower Shire Valley in Malawi through Mozambique and Zimbabwe to eastern South Africa and Swaziland .

The geographic distribution of the nyala may be based on the genetic variation . According to a study of the nyala in South Africa , Mozambique , Malawi and Zimbabwe , a great difference was marked among the gene frequencies at three microsatellite loci . Mitochondrial DNA analysis revealed the presence of a unique haplotype in individuals from each location . The conclusions were that the geographic variation in the nyala may be due to a distribution pattern based on the habitat specificity .

Today the nyala are found in South African protected areas in the KwaZulu @- @ Natal Game Reserves of Ndumo Game Reserve , uMkuze Game Reserve and Hluhluwe @- @ Umfolozi Game Reserve , and in Kruger National Park . According to statistics of 1999 , 10 @- @ 15 % of the nyala occur on private land . Currently efforts are being made to retain the populations of nyala in Gorongosa National Park and Banhine National Park in Mozambique . The nyala also thrive in Lengwe National Park in Malawi .

The nyala have never been observed showing signs of territoriality . Territories overlap extensively , let it be of any sex . The home ranges of males are approximately equal to that of females , about

10 km². in area .

= = Threats and conservation = =

The major threats to the population of the nyala are poaching , habitat loss , agriculture and cattle grazing . Rinderpest outbreaks have also contributed in population loss . This species is currently of Least Concern , and the population is considered stable by both the IUCN and CITES . As of 1999 , the total population of the nyala was around 32 @, @ 000 individuals . More recent estimates show that South Africa has at least 30 @, @ 000 nyalas , with 25 @, @ 000 in KwaZulu @-@ Natal . There are now more than 1 @, @ 000 on protected areas and ranches in Swaziland . In Mozambique there are not more than 3 @, @ 000 , in Zimbabwe there are over 1 @, @ 000 while numbers in Malawi have fallen from 3 @, @ 000 to about 1 @, @ 500 . Namibia has the least population , about 250 .

Today over 80 % of the total population is protected in national parks and sanctuaries , mostly in South African protected areas . These are the Ndumo Game Reserve , uMkuze Game Reserve and Hluhluwe @-@ Umfolozi Game Reserve and Kruger National Park . 10 to 15 % occur on private land . They mostly occur in South Africa due to the high demand for adult males as game trophies .