

Kirk's dik-dik

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Females, Etosha National Park, Namibia

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General

Dik-dik, members of the *Madoqua* genus, refer to any of the four species of dwarf antelope that inhabit the arid regions of eastern Africa.^[2] Guenther's dik-dik (*Madoqua guentheri*), Salt's dik-dik (*M. saltiana*), and the silver dik-dik (*M. piacentinii*) inhabit the Horn of Africa, while a population of Kirk's dik-dik (*M. kirkii*) that has undergone speciation has recently been discovered as a new species existing in Namibia.^[2]

Specifically, the Kirk's dik-dik, as noted by Haltenorth & Diller (1980), is believed to have six subspecies and possibly a seventh existing in southwest Africa.^[3] Dik-diks are herbivores, typically of a fawn color that aids in camouflaging themselves in savannah habitats.^[3] According to MacDonald (1985), they are also capable of reaching speeds of up to 42 kilometers per hour.^[4] The lifespan of Kirk's dik-dik in the wild is typically 5 years, but may surpass 10 years.^[4] In captivity males have been known to live up to 16.5 years, while females have lived up to 18.4 years.^[4]

Etymology

The dik-dik's name is derived from its call.^[2] When they feel threatened, dik-dik lie low to prevent detection.^[2] If they are discovered they run in a swift zigzag like pattern until they reach refuge in a nearby thicket.^[2] During this 'flight' they emit trumpet-like "zik-zik" calls to raise an alarm or to harass predators and publicize the presence of a mated pair.^[2]

Kirk's dik-dik



M. k. damarensis, female

Conservation status



Least Concern (IUCN 3.1)^[1]

Scientific classification

Kingdom:	Animalia
Phylum:	Chordata
Class:	Mammalia
Order:	Artiodactyla
Family:	Bovidae
Genus:	<i>Madoqua</i>
Species:	<i>M. kirkii</i>

Binomial name

Madoqua kirkii

Günther, 1880

Subspecies

4 ssp., see text

Physical Characteristics

“Dik-diks are some of the world’s smallest antelopes, with the largest, the Kirk’s dik-dik, standing between 14 and 18 inches tall and weighing no more than 7.2 kg (16 lb).^[2] Female dik-diks tend to be 1 to 2 pounds heavier than males.^[2] Dik-diks are dainty creatures with a pointed, mobile snout, large eyes and ears, prominent preorbital glands, pipestem legs, hare-like hind limbs that are significantly larger than their forelimbs, and a vestigial tail.^[2] Their coats, depending upon their habitat,^[5] range from grey to gray-brown with tan flanks, limbs, and an erectile head crest and whitish eye rings, ear lining, underparts, and rump”.^[2] Only male dik-diks sport horns, which are approximately 3 inches long, corrugated, and backward-slanted.^[2] Horns of male Kirk’s dik-dik may be straight or curved backwards from the profile of the face and the basal half of the horns have seven to nine annular ridges, that are frequently covered by the crest.^[4] Kirk’s dik-dik are sexually dimorphic: females are larger and lack horns, while males sport a more developed muzzle, a longer crest, and tend to be lighter in color.^[6] Though physically very similar the Kirk’s dik-dik can be distinguished from Guenther’s dik-dik due to its longer nasals and premaxillae and shorter proboscis, which gives the head a more wedged-shaped profile than that of Guenther’s dik-dik.^[4]

Adaptations

Kirk’s dik-diks are highly adapted to surviving in the arid regions of eastern Africa. They have a hairy proboscis with tiny slit-like nostrils, a feature that is most pronounced in the Guenther’s dik-dik.^[7] This proboscis contains an enlarged nasal chamber that is supplied with a rich amount of blood that is cooled via rapid nasal panting.^[7] Panting through their snouts leads to airflow and evaporation that cools the blood before it is pumped back into the body.² This process is also efficient, because it results in a minimal loss of water in the exhaled air.^[2] Water and energy conserving methods, such as fluctuating body temperatures, lowered metabolic rates, concentrated urine, and dry feces all contribute to the ability of the dik-dik to survive harsh arid climates.^[2] Further, as observed by Hoppe 1977b, Kamau 1988, and Maloiy et al., 1988, they also conserve fluids by licking dew from their nose and reabsorbing water from their feces.^[4] When compared to cattle, dik-dik have a significantly lower density of sweat glands.^[4] Behaviorally, dik-diks are highly nocturnal and during the daytime seek shade to rest throughout the hottest parts of the day to help avoid the loss of valuable fluids.^[7] Dik-diks are also highly selective when browsing on succulents, herbs, and foliage as to maximize fluid acquisition.^[2] The hind legs of the Kirk’s dik-dik are longer and are structurally more uniform, than the forelegs.^[4] Hopwood 1936 suggests that, this helps the hind legs propel the dik-dik forward, as the relatively short forelegs of dik-diks are more efficient at ascending broken terrain”.^[4]

Habitat and Territoriality

"Kirk’s dik-dik are endemic to savanna areas of eastern and southwestern Africa, occurring primarily in the Somali and Southwest arid biotic zones, but encroaching into the Southern savanna biotic zone".^[4] Their distribution can be described as discontinuous and as a result they often occur in dispersed patches due to their unique habitat requirements.^[4] In Namibia, Kirk’s dik-dik occur in isolated areas along the Fish River and do not reside in the Namib desert, though they may traverse desert thickets along sources of water.^[4] They prefer habitats with good cover but lacking tall vegetation.^[5] Ideal habitats contain a variety of browse, extensive shade, and an open understory at their eye level.^[4] (Tinley, 1969) As a result, they move to different ranges when grass grows too high and obstructs their view.^[5] As noted by Tinley (1969), typical habitats of Kirk’s dik-dik consist of thicket mosaics characterized by well-developed shrub layers and scant short grass cover.^[4] Dik-diks live in pairs on territories of 2–86 acres, depending on cover and resources.^[2] If no unfavorable events occur a pair of Kirk’s dik-dik may reside within the same territory for life.^[8] Males are the main defenders of territories, as females are unable to maintain territories themselves.^[4] (Kingdon 1982) According to MacDonald (1985), territorial conflicts over quality habitat are not frequent, however, when do

they occur, males charge one another, stopping just short of physical contact, before repeating the process by running from a longer distance.^[4] Furthermore, the encounter ends when one male surrenders, which results in both males scratching at the ground, urinating, and defecating”.^[4]

Diet

Dik-dik are herbivorous and their diets consist mainly of foliage, fruits, shoots, and berries.^[7] Due to their adaptations dik-dik are water independent and rely on vegetation as a source of water.^[7] Kirk's dik-diks are concentrate selectors, feeding selectively on dicotyledonous plants that can be rapidly fermented and digested. This includes leaves and fruit high in nutrients and water but low in fiber and cellulose. According to Hofmann (1973) and Hoopé et al. (1983), grasses are only consumed when they are germinating and Kirk's dik-dik have stomach capacities and mass that consist of 8.5–10.0% of body mass when full and 2.2% when empty”.^[4] As further explained by Hofmann (1973), because of the aforementioned facts and their high food requirements, Kirk's dik-dik feed and ruminate periodically throughout day and nighttime.^[4] Hendrichs (1975) stated that, they consume roughly 3.8% of their body mass daily.^[4]

Reproduction & Behavior

Similar to other dwarf antelopes, Kirk's dik-diks exist in monogamous pairs on territories.^[2] Territories are marked with dung and urine that are deposited in a ritual that is performed to help maintain pair bonds.^[2] During the ritual the female will excrete, followed by the male, which samples the female's urine stream to check her reproductive capacity.^[2] He paws over and then marks his dung and urine over her deposit.^[2] Finally, the pair garnishes nearby twigs with secretions from their pre-orbital glands.^[2] Kingon 1982 states that, “The male courts the female by running up behind her with his head and neck stretched and his muzzle pointing out in front. Copulation begins with the male standing on his hind legs behind the female and waving his forelegs at an acute angle to his own body in the air over her back”.^[4] Copulation typically occurs anywhere between three to five times within a 9-hour period.^[4] Kirk's dik-dik have a gestation period of 5–6 months and may produce up to two offspring a year.^[2] Females reach sexual maturity between 6 to 8 months of age, while the same occurs for males between 8 and 9 months.^[8] Dik-dik only have a single offspring at a time.^[2] Most births occur between November and December and April throughout May, which coincides with the timing of the rainy season.^[4] More so, dik-diks differ from other ruminants in that offspring are born with their forelegs along the body, rather than stretched out forward.^[4] “After birth, the offspring lie concealed away from their mother 2-3 weeks and survival rates for fawns are roughly around fifty percent.”^{[4][8]} Once offspring reach a certain age they also begin to participate in the bonding ritual and will remain with the parents until another offspring is born.^[2] At this point the parents will chase the older sibling out of their territory.^[7] Older siblings then seek out their own territories and mates.^[2]

Genetics

Dik-diks in general have complex chromosomal arrangements.^[9] They typically have $2n=46$ to $2n=48$ arrangements; however, it was noted that dik-diks with $2n=49$ have been discovered as well.^[9] Furthermore, as determined by Benirschke & Kumamoto (1987) and Kumamoto et al. (1994;1995), some have 47 chromosomes with X/A translocation.^[9] Kingswood & Kumamoto (1977) affirm that the two common cytotypes (46 and 48 chromosome individuals) are different enough so that resulting hybrids are sterile.^[9] "Many zoos are not known to harbor hybrids between different cytotypes, with anomalous chromosome numbers and causing unexplained sterility".^[9] Examination of these individuals show a lack of spermatogenesis in males, for example hybrids between Kirk's and Guenther's dik-dik are infertile.^[9] Predators Dik-diks are susceptible to a myriad of predators including eagles, cats, jackals, caracals, leopards, hyenas, cheetahs, cape hunting dogs, honey badgers, crocodiles, pythons, lions, and humans.^{[2][7][8]} Young

dik-diks are particularly preyed upon by baboons, genets, and eagles. Dik-diks have a fine-tuned sense of hearing, sight, and smell. When they feel in danger or hear the alarm calls of other animals they hide, rather than fleeing. It is only when frightened or disturbed that they emit their iconic “zik-zik” alarm.

Human Impacts and Interactions

Humans are the greatest threat to dik-diks, which are prized for their hides and bones.^[5] Snares are commonly used to capture them since the bones from their legs and feet are used in traditional jewelry while their hides are fashioned into suede gloves.^[5] Parker (1990) noted that it requires a single dik-dik hide to produce a single glove.^[4] Nowak (1991) asserted that dik-diks are disliked by locals because they flush and warn larger game when hunters are present.^[4] Kingdon (1982) revealed that dik-diks also benefit from the destruction of habitat via human-mediated slash and burn agriculture that results in the subsequent secondary growth of shrubs that serve as the perfect food source and ideal place of refuge for dik-dik.^[4] The IUCN Redlist lists the Kirk's dik-dik as least concerned.^[10]

Subspecies

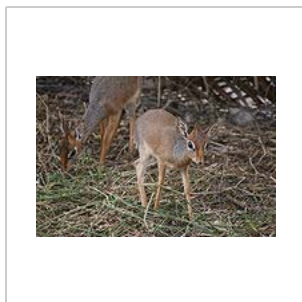
Usually, four subspecies of Kirk's dik-dik are distinguished, but in fact they may represent three or more distinct species:^[11]

- *M. k. kirkii* Günther, 1880
- *M. k. cavendishi* Thomas, 1898 – Cavendish's dik-dik
- *M. k. damarensis* Günther, 1880 – Damara dik-dik
- *M. k. hindei* Thomas, 1898

Gallery



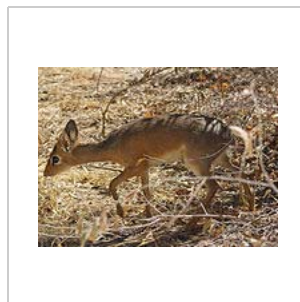
Female from Etosha National Park, Namibia



Juvenile



Family, Lake Manyara, Tanzania



Male, Etosha, Namibia

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- <http://www.awf.org/wildlife-conservation/dik-dik>
- <http://www.science.smith.edu/msi/pdf/i0076-3519-569-01-0001.pdf>
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- http://www.ultimateungulate.com/Artiodactyla/Madoqua_kirkii.html

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- *Animal*, Smithsonian Institution, 2005, pg. 253

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Categories: IUCN Red List least concern species | Madoqua

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