

Tragelaphus eurycerus. By Katherine Ralls

Published 29 December 1978 by the American Society of Mammalogists

**Tragelaphus eurycerus (Ogilby, 1837)**

Bongo

*Antelope eurycerus* Ogilby, 1837:120. (not *euryceros* as in Lydekker and Blaine, 1914). Type locality, West Africa.

*Tragelaphus eurycerus* Lesson, 1842:181, first use of name combination.

*Tragelaphus albo-virgatus* du Chaillu, 1861a:299. Type locality Ashkankolo Mountains (Gabon).

**CONTEXT AND CONTENT.** Order Artiodactyla, Family Bovidae, Subfamily Bovinae, Tribe Tragelaphini. The genus *Tragelaphus* contains eight living species (Van Gelder, 1977).

The large gap between the western and eastern ranges of *T. eurycerus* and the isolation of Kenyan populations suggests that there may be several subspecies. However, the nominal subspecies have been described on the basis of characters that have not been shown, so far, to be characters of populations rather than individuals. A critical assessment of the named forms will not be possible until a thorough examination of the available specimens is made (Haltenorth, 1963; Ansell, 1971). The names available for subspecies are as follows:

*Antelope eurycerus* Ogilby, 1837:120, see above.

*Tragelaphus albo-virgatus* du Chaillu, 1861a:299, see above.

*Boocercus eurycerus isaaci* Thomas, 1902:309. Type locality Eldoma Ravine, British East Africa (Kenya).

*Boocercus eurycerus katanganus* Rothschild, 1927:271. Type locality Katanga Province, Djingile, "Kabouso Territory, Laurami District" (Kabongo Territory, Lomani District, according to Schoutenden, 1946), Belgian Congo (Zaire).

*Boocercus eurycerus cooperi* Rothschild, 1928:306. Type locality Haut Uele District, Belgian Congo (Zaire).

Some question exists about the type localities of *Tragelaphus albo-virgatus* and *Boocercus eurycerus katanganus*—see remarks under "Distribution."

**DIAGNOSIS.** The bongo differs from all other species in the genus *Tragelaphus* except the eland, *T. oryx*, by the presence of horns in the female. Most authorities also indicate that only the bongo and the eland have cowlike tails. This is not a wholly reliable character, however, as the tail of the bongo changes in appearance with age. The tail of a young bongo resembles that of other members of the genus: it is flattened, with a white margin and a black tip (shown in Root, 1959). As the animal matures, this tip develops into a pronounced black tuft and the tail acquires a more bovine appearance (shown in Van den Bergh, 1961) as in the eland. However, even females that have borne young may retain a fringe of longer white hairs on each side of the tail (personal observation).

The absence of inguinal glands has been said to separate the bongo and eland from other species of the genus but the greater kudu, *T. strepsiceros* (Ansell, 1971), and lowland nyala, *T. angasi* (Tello and Van Gelder, 1975), also lack them.

The bongo is not likely to be confused with the eland, which is much larger, with relatively shorter horns, and lives in grassland rather than in forests. The eland has a dewlap and the bongo does not.

**GENERAL CHARACTERS.** The bongo is the largest of the forest-dwelling antelopes (figure 1). Haltenorth (1963) gave the following approximate weights and measurements: weight 150 to 220 kg, total length 215 to 315 cm, tail 45 to 65 cm, shoulder height 110 to 125 cm. Males are larger than females. Ears are very large and broad. A short erectile mane runs from shoulder to rump. The muzzle is naked. No facial, pedal, or inguinal glands are present (Pocock, 1944). There are four inguinal mammae. Both sexes have large, dark, blackish-brown horns, which form an open spiral, making one complete twist. White to yellowish tips develop with age. Average length of horns in mature males is about 80 cm; record 100.3 cm (Best, Edmond-Blanc, and Raw, 1969). Horns of females tend to be more parallel than those of males, with tips closer together (shown in Lydekker and Blaine,

1914, and Mellon, 1975), and sometimes asymmetrical or deformed. Pelage is bright chestnut red, darkening in males with age and eventually becoming blackish, especially on the head and forequarters. However, even black-faced males retain broad brown "spectacle" marks around the eyes. White markings, the same in both sexes, include a conspicuous white chevron between the eyes, two large white spots on each side of the head, a white to yellowish crescent on chest, and a variable number of narrow vertical stripes on the shoulders, flanks, and hindquarters, usually continuing into mane. The numbers of stripes on the two sides are rarely equal (shown in Leister, 1933, and Van den Bergh, 1961), usually ranging from 10 to 15 per side. *Tragelaphus e. isaaci* from Kenya supposedly has fewer stripes than other putative subspecies (Lydekker and Blaine, 1914); however, a male from Kenya now at the National Zoological Park, Washington, D. C., has 16 stripes on one side (figure 1). Legs have a striking pattern of black and white markings.

The skull of a male bongo from Kenya is shown in figure 2.

**DISTRIBUTION.** The bongo is discontinuously distributed in western and eastern parts of the Lowland Forest Zone of Africa, and in several isolated populations in the montane forests of East Africa (figure 3). Ansell (1971), on whom the following account is based, discussed many doubtful and unconfirmed records, and several areas in which the range extends slightly beyond the Lowland Forest Zone.

From Sierra Leone, and probably the adjacent forested part of Guinea near the border, it ranges east to Togo. The records of Baudenon (1952) and of Raynaud and Georgy (1969) suggest that bongo may occur in the Dahomey Gap in forest outliers between about 7 and 10 degrees north latitude. It is absent from the area east of the Dahomey Gap to the Sanaga River. Happold (1973) gave references on its distribution in West Africa. South of the Sanaga it ranges virtually throughout the Lowland Forest.

In East Africa, it is on Mt. Kenya, and in the Aberdare and Mau forests of Kenya. It no longer occurs in the Cherangani Hills and Chepalungu Forest (Anon., 1977). In view of the close resemblance between the distribution of the bongo and that of the giant forest hog, *Hylochoerus meinertzhageni*, it seems possible that the bongo may occur, or may once have occurred, in the montane



FIGURE 1. Photograph by Kent Redford of an adult male bongo, captured in Kenya, now at the National Zoological Park.

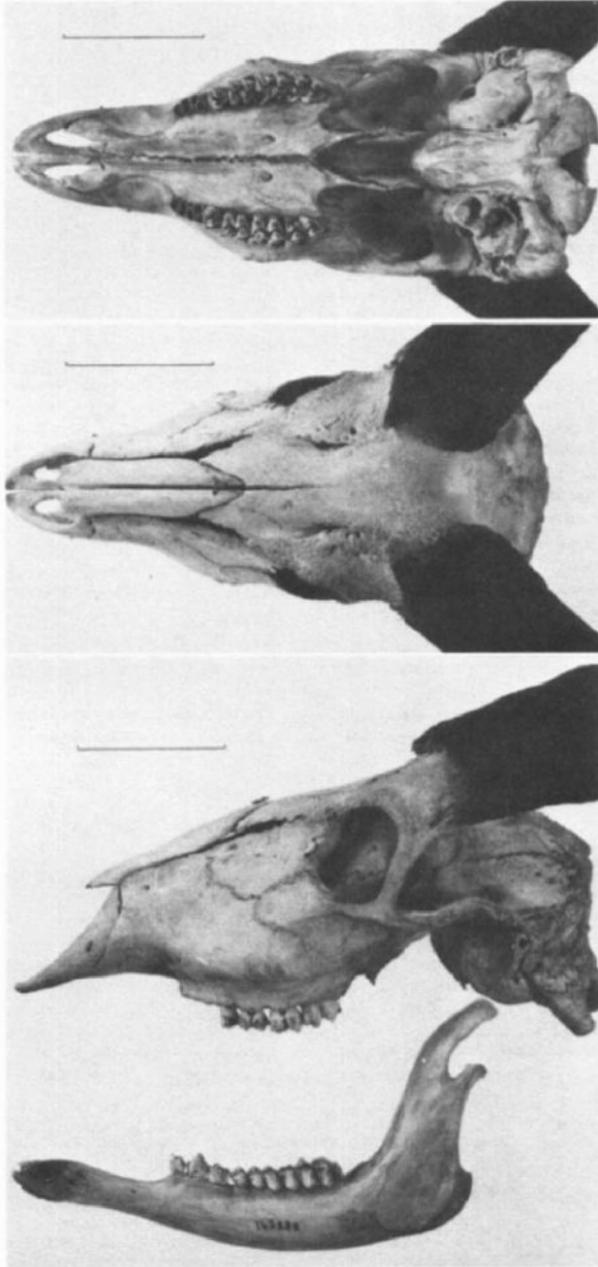


FIGURE 2. Photographs of the skull of a male bongo from Kenya USNM, 16322), in dorsal, ventral, and lateral views.

forests of southwestern Ethiopia and in northern Tanzania (Ansell, 1971). However, it has not been confirmed in either country to date (Anon., 1977). It may also occur in Uganda (Anon., 1977) and also has been reported from mountains bordering Lake Kivu, Zaire (Babault, 1935).

Some doubt exists as to whether the bongo ever occurred in the region where du Chaillu supposedly obtained the holotype of *T. albo-virgatus* (Malbrant and Maclatchy, 1949; Ansell, 1971). However, a specimen is listed by Lydekker and Blaine (1914)—BM 71.5.27.5, an immature mounted skin from the Ashkankolo Mountains—that was presented by du Chaillu in 1871. Blancou (1958) noted that it would have been unlikely for du Chaillu to obtain complete skins of bongo from a long distance away, as native skins usually lack head and limbs. He thought it more likely that the bongo has since become extinct in this region.

Kabongo Territory, the type locality for *Boocercus eurycerus katanganus*, is south of the limits of the Lowland Forest and Schoutenden (1946) did not map this locality. Ansell (1971) suggested that the status of the bongo in this area requires confirmation.

**FOSSIL RECORD.** Despite early claims to the contrary, fossil Tragelaphini have been found only in Africa (Gentry, 1970). *Tragelaphus nakuae*, from the Plio-Pleistocene of Omo, Ethiopia, shares some characters with the bongo, and indeed was originally listed as *Tragelaphus (Boocercus?) nakuae* by Arambourg (1941). However, it differs in a number of other characters, particularly the conformation of the back of the cranium, and seems to represent a lineage of *Tragelaphus* rather remote from any other (Leakey, 1965; Gentry, 1976). No other close relatives or likely ancestors for the bongo are known, which is not surprising because forest-living mammals are not common in the fossil record.

**FORM AND FUNCTION.** Detailed descriptions of rhinarium, facial vibrissae, and ears and feet were given in Pocock (1944). For description of skull and comparison to related species see Lenz (1952), who gave a basal length of 399 mm for a male and 344 for a female. Thomas (1902) gave some cranial measurements of East African specimens.

Lengths and diameters of limb bones were given in McMahon (1975). The bongo is relatively short-legged compared to other tragelaphines. The noticeably short metacarpal, and thick radius and metapodials, are as expected in a forest species (Gentry, 1974; Oboussier and Ernst, 1977).

Hofmann and Scholz (1968) distinguished three major types of ruminant body shapes, functionally related to habitat and flight behavior. Bongos have a "Type C" body shape, characteristic of forest ruminants—a convex back with its high point in the lumbar region and with head frequently lowered or stretched forward. According to Roosevelt and Heller (1914:454), bongos can move rapidly through the forest in this position, "getting under low limbs and through narrow openings in a way astounding for so big an animal."

**ONTOGENY AND REPRODUCTION.** Reproductive data from the first group of bongos to breed in captivity are given in Ralls *et al.*, 1978, on which the following account is based. Females come into estrus at intervals of approximately 21 or 22 days and remain in estrus for about three days. The shortest interval observed between parturition and copulation was 23 days. Although Finn (1923) claimed that bongos usually have multiple births, this seems unlikely in such a large bovid. All 11 captive births have been single calves. In two cases, gestation periods were 282 and 285 days. Due to an arithmetical error the first of these was originally reported as 294 to 296 days (Xanten, 1972).

Details of parturition in captivity and measurements of calves at birth are given in Ralls *et al.*, (1978). The mean weight of three calves at birth was 19.5 kg. The neonate calf has the white markings of the adult although its background pelage is somewhat paler than that of adult females (Roosevelt and Heller, 1914; Dollman, 1934). Two captive-born females first conceived at 27 months and 31 months of age. One animal, a female, lived in captivity for 18 years, 2 months, and 17 days, and was 19 years, 4 months, and approximately 23 days old at death (Crandall 1964).

**ECOLOGY.** In Kenya, the bongo occurs in montane high forest and bamboo forest, usually between 2100 and 3000 m (Ansell, 1971). During a brief study on Mt. Kenya in the dry season, Edmond-Blanc (1960) found bongos most often at lower elevations in the bamboo forest. The bamboo served primarily as a refuge, bongos emerging to feed and remaining outside of the bamboo longer on cloudy than on clear days. Outside of the bamboo forest, signs of bongos were found most frequently in high primary forest, in part composed of *Erlangea* sp., large ferns, sedges, and urticaceous plants.

In most of its range, the bongo is found mainly in lowland forest. In the Ivory Coast, it prefers to rest in particularly dense patches of vegetation, often consisting largely of *Ancistrophyllum secundiflorum*, a spiny climbing palm, or *Marantochloa purpurea* (Etienne Gout, personal communication).

Hofmann and Stewart (1972) classified the bongo as a "tree and shrub foliage eater" within the larger category of "selectors of juicy, concentrated herbage." The little that is known about the food habits of bongos supports this. Edmond-Blanc (1960) found that the principal foods on Mt. Kenya were a legume, *Parochetus communis*, and a climbing plant, *Senecio biaffrae* (probably *Crassocephalum bojeri*). He found no trace of bamboo in the stomachs of two specimens, although Ionides (1946) claimed that bamboo shoots are a favorite food. Kipsigis informants in Kenya reported that bongos eat *Acanthopale albosetulosa* and *Mimulopsis solmsii*, both herbs belonging to the Acanthaceae (Glover, Stewart, and Gwynne, 1966). *Mimulopsis solmsii* flowers mas-

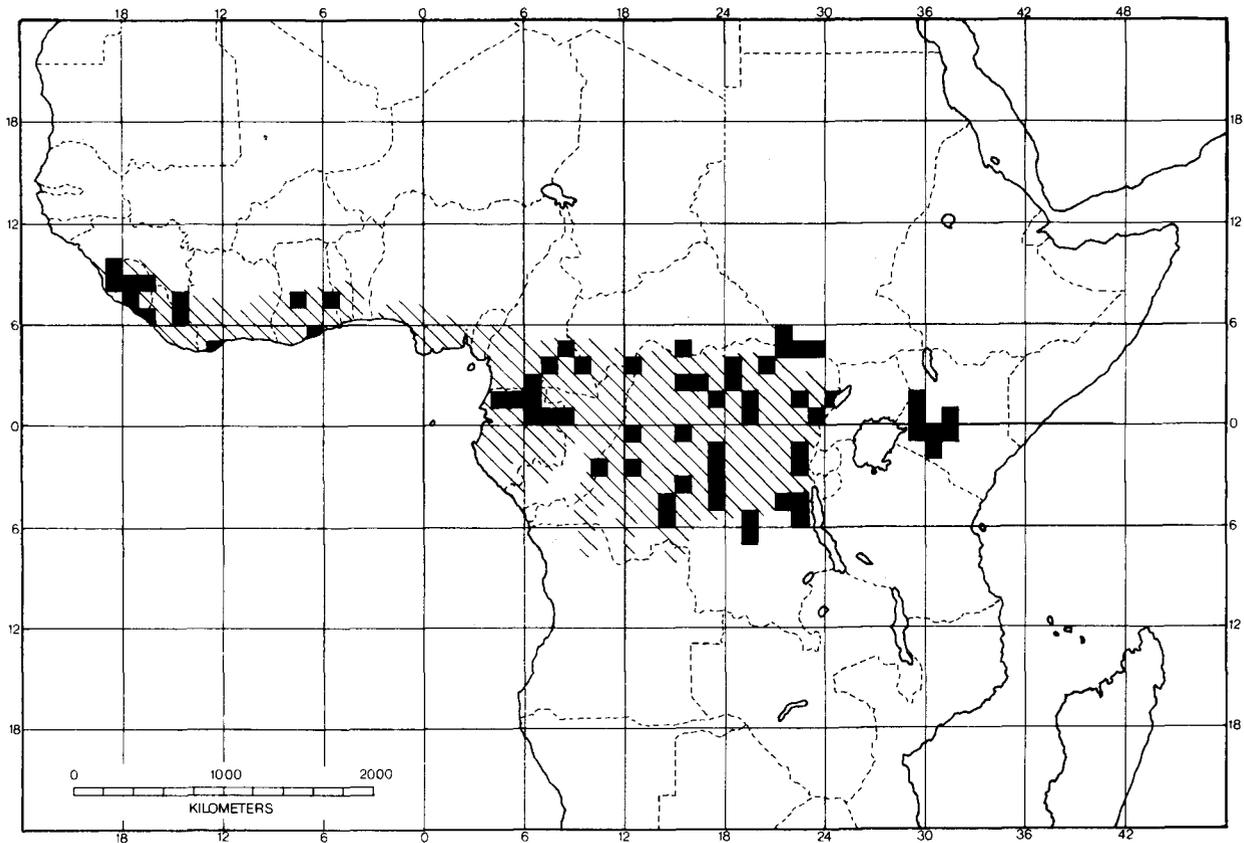


FIGURE 3. Central Africa, showing probable distribution of bongo. Approximate location of lowland forest shown by shaded area. Bongo records plotted as blackened one-degree squares. Questionable type localities of Ashkankolo Mountains (Gabon) and Kabongo Territory (Zaire) not mapped. Based on an unpublished map by W. F. H. Ansell.

sively at intervals of approximately seven years. According to the Wandorobo, the vines are quite toxic the second year after flowering and cause mortality among bongo (Simon, 1963).

The following observations in the Ivory Coast on the plants selected by a young female bongo, that was taken on daily feeding walks near the place of her capture, were supplied by Etienne Gout. She ate the leaves of young saplings (less than two meters tall) of *Musanga cecropioides* and *Ceiba pentandra*, and both leaves and branches of *Trema orientalis*. Jeffrey (1974) also reported bongo browsing on *M. cecropioides* and *T. guineensis* (= *T. orientalis*.) The captive also ate leaves of *Urera repens* and *Ampeloussus leonensis*, and young leaves and buds of *Costus albus*. These are all typical plants of the secondary forest, where bongos often feed in this region. She also ate the tips of a grass, *Paspalum conjugatum*, found in small clearings. West African bongos visit deserted farmlands for cassava and sweet potato leaves and also raid cocoyam farms for tender young leaves (Cansdale, 1951). Bongos sometimes use their horns to attain food when browsing ("Tisti," 1964).

Bongos eat salty earth and visit salt licks (Lydekker, 1926; Ionides, 1946; "Tisti," 1964; Stanley-Price, 1969). They are fond of charred and rotten wood (Lydekker, 1926; "Tisti," 1964; personal observation). The feces of the bongo more closely resemble the loose form of the buffalo than the pellets of other tragelaphines ("Tisti," 1964).

Although bongos are considered difficult to shoot (Mellon, 1975), they are rather easily hunted with dogs ("Tisti," 1964; Stanley-Price, 1969). The combination of habitat destruction, poaching, and illegal trapping, is responsible for the recent decline of the population in Kenya (Stanley-Price, 1969; Anon., 1977). Bongos can be captured alive by setting camouflaged pit traps across frequently used trails (Reed and Buechner, 1976).

**BEHAVIOR.** Little is known of the behavior of bongos in the wild, because of the density of their natural habitat and their retiring nature. Small groups and solitary individuals, often old males, have been observed (Ionides, 1946; Stanley-Price, 1969; Verschuren, 1975). The behavior of a captive group has been

observed by Ralls *et al.* (1978) and the following description is based on their account.

The sexual behavior is similar to that of other tragelaphines as described by Walther (1964). The male follows the estrous female, neck extended in a "low stretch" posture, while emitting repeated soft vocalizations. He often rubs the side of his head and neck on her side, and presses his head on her rump as a test of receptivity to mounting. Like other tragelaphines, the bongo was never seen to use a kick of the front leg ("laufschlag") for this purpose. He assumed a "frozen" posture, facing away from the female, just before mounting.

The behavior of estrous females varied. Sometimes the only marked contrast to their usual behavior was that they tolerated the male's close approach, contact, and mounting. At other times they actively initiated sexual contact, approaching the male and licking his genitals.

**GENETICS.** The male bongo has an unusual diploid number of 33 chromosomes, because the Y chromosome is translocated to an autosome and is late replicating. Presumably the diploid number of the female is 34. The X chromosome is an unusually large submetacentric. The fundamental number of chromosomal arms is 60 (Wurster, 1972).

Male bongo and female sitatunga, *Tragelaphus spekei*, have produced fertile hybrids in captivity (Tijskens, 1968; Koulischer *et al.*, 1973).

**REMARKS.** The bongo resembles the eland, *T. oryx*, rather than other members of the genus *Tragelaphus*, in the presence of horns in females, and the structure of the tail. However, it also differs from the eland in many characters (Pocock, 1944). I follow Ansell (1971) and Van Gelder (1977) in including the bongo in *Tragelaphus*. Others have placed the bongo and the eland in a separate genus, *Taurotragus* (Simpson, 1945) or given the bongo its own monotypic genus, *Boocercus*, *Euryceros* being preoccupied (Thomas, 1902).

*Tragelaphus* is from the Greek words *tragos* for "goat" and *elaphos* for "deer." The specific name *euryceros* is from the

Greek word *eurys* meaning "wide" and *keras* for "horn," and refers to the broad spreading horns.

I thank W. F. H. Ansell, A. Gentry, P. Grubb, D. C. Hapgood, C. Hillman, and R. G. Van Gelder for advice and helpful comments on the initial draft of the manuscript.

#### LITERATURE CITED

- Anonymous. 1977. Report of the working group on the distribution and status of East African mammals. Phase I: Large mammals. East African Wild Life Society Scientific and Technical Committee, Nairobi, 110 pp.
- Ansell, W. F. H. 1971. Order Artiodactyla. The mammals of Africa. An identification manual (J. Meester and H. W. Setzler, eds.), Smithsonian Inst. Press, Washington, 15:1-84.
- Arambourg, C. 1941. Antilopes nouvelles du Pléistocène ancien de l'Omo (Abyssinie). Bull. Mus. Nat. Hist., Paris 13:339-347.
- Babault, G. 1935. Notes sur les *Boocercus* du Kivu. Bull. Mus. Nat. Hist., Paris 7:224-225.
- Baudenon, P. 1952. Notes sur les bovids du Togo. Mammalia 16:49-61, 109-121.
- Best, A. A., F. Edmond-Blanc, and W. G. Raw (eds.) 1969. Rowland Ward's records of big game, XIIIth ed., Rowland Ward, London, 512 pp.
- Blancou, L. 1958. Distribution géographique des ongles d'Afrique Equatoriale Française en relation avec leur ecologie. Mammalia 22:294-316.
- Cansdale, G. S. 1951. Animals of West Africa. London, 2nd ed., 143 pp.
- Crandall, L. S. 1964. The management of wild mammals in captivity. Univ. Chicago Press, xv + 761 pp.
- Dollman, J. G. 1934. Foetal and post-natal coats of the antelopes of the subfamily Tragelaphinae. Proc. Linnean Soc. London 147:5-6.
- du Chaillu, P. B. 1861a. (Descriptions of five new species of mammals discovered by him in western equatorial Africa). Proc. Boston Soc. Nat. Hist. 7:296-304.
- . 1861b. Explorations and adventures in equatorial Africa. Harper and Brothers, New York, xxii + 631 pp.
- Edmond-Blanc, F. 1960. Contribution à l'étude du comportement et de la composition de la nourriture du bongo (*Boocercus eurycerus isaaci*) et de l'hylochère (*Hylochoerus meinertzhageni*) du versant sud du Mont Kenya. Mammalia 24:538-541.
- Finn, F. 1923. Hoofed animals, Pp. 1-146, in Animals of all countries, Hutchinson, London.
- Gentry, A. S. 1970. The Bovidae (Mammalia) of the Fort Ternan fossil fauna. Fossil Vertebrates of Africa, 2:243-323.
- . 1974. A new genus and species of Pliocene boselaphine (Bovidae, Mammalia) from South Africa. Ann. South African Mus. 65:145-188.
- . 1976. Bovidae of the Omo Group deposits. Pp. 275-292, in Earliest man and environments in the Lake Rudolf Basin (Y. Coppens, F. C. Howell, G. H. Isaac, and R. E. F. Leakey, eds.), Univ. Chicago Press.
- Glover, P. E., J. Stewart, and M. D. Gwynne. 1966. Masai and Kipsigis notes on East African plants. Part I—Grazing, browse, animal associated and poisonous plants. East African Agric. For. Jour. 32:184-191.
- Haltenorth, Th. 1963. Klassifikation der Säugetiere: Artiodactyla 1 (18). Handb. Zool. 8 (32):1-167.
- Hapgood, D. C. D. 1973. The distribution of large mammals in West Africa. Mammalia 37:88-93.
- Hofmann, R. R., and P. Scholz. 1968. Applied topographic-anatomical studies of East African game ruminants. East African Wildlife Jour. 6:107-123.
- Hofmann, R. R., and D. R. M. Stewart. 1972. Grazer or browser: a classification based on the stomach-structure and feeding habits of East African ruminants. Mammalia 36:226-240.
- Ionides, C. J. P. 1946. A few notes on the bongo, *Boocercus eurycerus*, based on a hunting expedition in the Mau Forest. Jour. East African Nat. Hist. Soc. 19:138-139.
- Jeffrey, S. M. 1974. Antelopes, duikers, and hogs of the dry high forest of Ghana. Nigerian Field 39:27-33.
- Koulischer, L., J. Tijskens, and J. Mortelmans. 1973. Chromosome studies of a fertile mammalian hybrid: the offspring of the cross bongo x sitatunga (Bovidea). Chromosoma 41:265-270.
- Leakey, L. S. B. 1965. Olduvai Gorge, 1951-1961. Univ. Cambridge Press, 1:xiv + 1-118.
- Lesson, R. P. 1842. Nouveau tableau du regne animal. Mammifères. Arthus-Bertrand, Paris, 204 pp.
- Leister, C. W. 1933. The bongo comes to the zoological park. Bull. New York Zool. Soc. 36:33-37.
- Lenz, C. 1952. Vergleichende Betrachtungen an Antilopen. Zool. Jb. Allg. Zool. 63:403-476.
- Lydekker, R. 1926. The game animals of Africa. Rowland Ward, London, xix + 484 pp.
- Lydekker, R., and G. Blaine. 1914. Catalogue of the ungulate mammals in the British Museum. British Mus. (Nat. Hist.), London, 3:xv + 1-283.
- Malbrant, R., and A. Maclatchy. 1949. Faune de l'Equateur Africain Française, II, Mammifères. Lechevalier, Paris, 317 pp.
- McMahon, T. A. 1975. Allometry and biomechanics: limb bones in adult ungulates. Amer. Nat. 109:547-563.
- Mellon, J. (ed.) 1975. African Hunter. Harcourt Brace Jovanovich, New York, 552 pp.
- Oboussier, H., and D. Ernst. 1977. Der formative Einfluss des Lebensraumes auf das post craniale Skelett der Tragelaphinen (Tribus Tragelaphini Sokolov, 1953—Bovidae, Mammalia). Zool. Jb. Syst. 104:203-238.
- Ogilby, W. 1837. Remarks upon some rare or undescribed ruminants in the Society's collection. Proc. Zool. Soc. London (for 1836), pp. 119-121.
- Pocock, R. I. 1944. The external characters of a bongo (*Boocercus eurycerus*) that died in the Society's gardens. Proc. Zool. Soc. London 113B:201-205.
- Ralls, K., H. Buechner, and R. Kiltie. 1978. Behavior and reproduction of bongo, *Tragelaphus eurycerus* at the National Zoological Park, Washington, D. C. Der Zool. Gart., in press.
- Raynaud, J., and G. Georgy. 1969. Nature et chasses au Dahomey. Imprimerie Gutenberg, Paris, 320 pp.
- Reed, T. H., and H. K. Buechner. 1976. The acquisition of bongo antelope and their breeding history at the National Zoological Park. Pp. 349-354, in National Geographic Society Research Reports, 1968 Projects, National Geographic Society, Washington, D. C.
- Root, A. 1959. Bringing up bongo. Wild Life 1(2):8-9, 30, 31.
- Roosevelt, T., and E. Heller. 1914. Life histories of African game animals. Scribner's, New York, 2:421-798.
- Rothschild, Lord. 1927. On a new race of bongo and gorilla. Ann. Mag. Nat. Hist., ser. 9, 19:271.
- . 1928. In Dollman, J. G., and J. B. Burlace (eds.) Rowland Ward's records of big game. Rowland Ward, London, IXth ed., 467 pp.
- Schouteden, H. 1946. De zoogdieren van Belgisch Congo en van Ruanda-Urundi. Ann. Mus. Royal Congo Belge 4 to Ser. II 3:333-576.
- Simon, N. 1963. Between the Sunlight and the Thunder: the wildlife of Kenya. Houghton Mifflin, Boston, 320 pp.
- Simpson, G. G. 1945. The principles of classification and a classification of the mammals. Bull. Amer. Mus. Nat. Hist. 85:xvi + 1-350.
- Stanley-Price, M. 1969. The bongo of the Cherangani Hills. Oryx 10:109-111.
- Tello, J. L. P. L., and R. G. Van Gelder. 1975. The natural history of nyala *Tragelaphus angasi* (Mammalia, Bovidae) in Mozambique. Bull. Amer. Mus. Nat. Hist. 155:319-386.
- Thomas, O. 1902. On the East-African representatives of the bongo and its generic position. Ann. Mag. Nat. Hist., ser. 7, 10:309-310.
- Tijskens, J. 1968. Preliminary notes on the F<sub>1</sub> bongo antelope × sitatunga hybrids, *Taurotragus eurycerus* × *Tragelaphus spekei*, at Antwerp Zoo. Internat. Zoo Yearbook 8:137-139.
- "Tisti" 1964. The magnificent Kenya Bongo. Africana 1(10):6-7.
- Van den Bergh, W. 1961. L'antelope bongo (*Boocercus eurycerus*) (Ogilby). Zoo 27:7-13.
- Van Gelder, R. G. 1977. An eland × kudu hybrid, and the content of the genus *Tragelaphus*. Lammergeyer 23:1-6.
- Verschuren, J. 1975. Wildlife in Zaire. Oryx 13:149-163.
- Walther, F. 1964. Verhaltensstudien an der Gattung *Tragelaphus* De Blainville, 1816 in Gefangenschaft, unter besonderer Berücksichtigung des Sozialverhaltens. Z. Tierpsychol. 21:393-467.
- Wurster, D. H. 1972. Sex-chromosome translocations and karyotypes in bovid tribes. Cytogenetics 11:197-207.
- Xanten, W. A., Jr. 1972. Gestation period in the bongo (*Boocercus eurycerus*) Jour. Mammal. 52:252.

Principal editor of this account was S. ANDERSON.

K. RALLS, NATIONAL ZOOLOGICAL PARK, WASHINGTON, D.C. 20008.