

Notes on the Yellow-backed duiker

Cephalophus sylvicultor

in captivity with comments on its natural history

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The forest duikers *Cephalophus* spp are a small, little-known group of 15 species (Ansell, 1971) of African bovids which is widely distributed throughout sub-Saharan Africa. To study their behaviour in the wild is not easy because of their elusive habits and the difficult terrain in which they live, and there are few captive studies. The information which is available includes Ralls' (1973, 1974, 1975) studies of captive Maxwell's duiker *C. maxwelli*, Dubost's (1980) field study of the Blue duiker *C. monti-*

cola, Farst *et al.* (1980) on species bred at the Gladys Porter Zoo in Brownsville and Udell (1981) on the Zebra duiker *C. zebra* at Los Angeles. The following report describes observations on the Yellow-backed duiker *C. sylvicultor* at the National Zoological Park, Washington, and provides a review of what is known about the species both in captivity and in the wild.

The forest duikers are considered primitive antelopes (Estes, 1974) which are thought to

have diverged early in bovid evolution and thus to have retained numerous primitive characteristics. Moreover, the group is relatively homogeneous. All *Cephalophus* spp are small (4–64 kg) and their build, gait and short slanted horns seem well adapted to movement through the thick vegetation of their forest habitats. All duikers are browsers but individual species may be exclusively frugivorous, or frugivorous and herbivorous (Gautier-Hion *et al.*, 1980). Their activity rhythms are variable (Dubost, 1980) with the Yellow-backed duiker being active both during the day and at night, while some species are exclusively diurnal (e.g. *C. monticola*) or nocturnal (e.g. the Bay or Black-backed duiker *C. dorsalis*); these differences may be a function of size and diet. Dubost (1980) also notes that modes of communication may reflect when a species is most active. All duikers rely on olfactory and, to a lesser extent, acoustic communication, but *C. monticola* employs many more visual signals than does *C. sylvicultor*, which in turn may use more visual signals than the totally nocturnal *C. dorsalis*. The duikers' response to danger is to take cover and hide and in keeping with this their coloration tends to be cryptic. Offspring are also well concealed since duikers are typical 'hider' species (Walther, 1979). There is little sexual dimorphism, the sexes being similar in coloration and size, although ♀♀ may be slightly larger than ♂♂, and both having short spike-like horns and well-developed maxillary scent glands (Ralls, 1976).

Based on Aeschlimann's (1963) and Ralls' (1973) studies of captive Maxwell's duikers it has been suggested that forest duikers are monogamous, although in the field this has been confirmed for only the Blue duiker where pairs and their immature offspring occupy small home ranges or territories which both sexes defend from conspecific intruders. None of the species appears to have a reproductive season, and a single calf, which receives little parental care, is apparently the norm (Estes, 1974). Pairing appears to be permanent, and young leave their parents during their second year. Interactions between neighbouring pairs or family groups are rare.

The Yellow-backed duiker is found in West Africa, having a range which extends from

Guinea Bissau and Gambia south into Angola and east as far as Kenya (Ansell, 1971). It is the largest of the Cephalophinae, standing up to 86 cm at the shoulder (Lydekker & Blaine, 1914) and weighing up to 64 kg in the wild (Smithers, 1966). A captive-born, five-year-old ♂ at Washington NZP weighed 80 kg when it died, however, and Gautier-Hion *et al.* (1980) estimated their specimens to weigh 68 kg. The adult is jet black except for a triangular yellow rump (or dorsal) patch and an orange crest of hair between the horns. The species is considered to be most closely related to Abbott's duiker *C. spadix* which is similar in appearance but slightly smaller, and to Jentink's duiker *C. jentinki*, these three species forming a distinct group usually referred to as the large or 'giant' duikers of which the Yellow-backed and Abbott's duikers may comprise a superspecies (Ansell, 1971). None has been the object of any major study, either in the wild or in captivity. Our observations suggest that the Yellow-backed duiker departs little from the generalised forest duiker form, although a knowledge of which features differ and how is essential, both to provide effective captive management and breeding, and to further our understanding of the evolution of the Bovidae.

HUSBANDRY

At Washington NZP two pairs of Yellow-backed duikers, one wild caught and the other captive born, are exhibited in 0.65 and 0.71 ha outdoor enclosures which are surrounded by a combination of fences and moats. A holding area 4.6 × 9.8 × 2.2 m high adjacent to the main enclosure allows us to separate the wild-caught ♂ from his mate when necessary. Each pair also has free access to a smaller, sunlamp-heated stall c. 3.4 × 4.7 × 2.6 m high. The concrete floors of the stalls are covered in rubber matting to prevent lameness and subsequent splaying of the hind legs, and hay is provided as bedding. To provide the duikers with plenty of hiding places the outdoor enclosures are well planted with pampas grass, shrubs, and trees which are protected by wooden guards to prevent overbrowsing. The provision of good cover is important because many duikers are very highly strung and easily frightened by even minor disturbances; our

produced four ♂♂ and only one ♀. Another trend observed in the East London animals was that ♀♀ were born after longer mean interbirth intervals than were ♂♂ (275.4 days compared to 254.6) (Von Ketelhodt, 1977). The data for Yellow-backed duikers present a similar picture with ♀♀ being born after a mean interbirth interval of 612.14 days and ♂♂ after 400.75 days. It is unclear, however, whether this difference represents a 'real' phenomenon in the Yellow-backed duiker or merely reflects captive management; for example, in many cases it is unknown whether the ♀♀ were with ♂♂ continuously and if not how often they were introduced.

MATERNAL CARE

The two duiker calves we observed received little maternal care, although their dams did lick and groom them. They did not follow their mothers but spent most of their time lying alone, seeming to prefer protected spots at the bases of vertical objects such as trees or clumps of grass. Nursing was infrequent, but individual bouts of nursing were sometimes quite long. One ♂ calf was seen nursing for seven minutes immediately after birth, and 15 minutes at two days of age; a bout lasting 12 minutes was seen for a ♀ calf aged five weeks. Calves are probably weaned at four to six weeks of age but may begin eating solid food much earlier. One calf was seen nibbling grass when it was eight days old.

In captivity ♂ duikers are generally indifferent to calves, but they can become intolerant and must then be removed to prevent them injuring the young.

HAND-REARING

Our Yellow-backed duiker ♀♀ appear to be relatively good mothers, and have been allowed to rear their own young. Recently, however, it was decided to hand-rear any ♂♂ born at the zoo in the hope that they would then be more tractable for crate-training and subsequent shipping. Females are still left with their mothers. Two ♂♂ have now been reared and complete notes are available for one.

So that the calf would receive at least some colostrum, it was not taken from its mother

until 48 hours after birth. Carnation evaporated milk in a 1:1 ratio with water and supplemented with vitamins and iron was offered eight hours after separation but, being very frightened, the calf would not accept it and had to be force-fed 60 ml of the formula; five hours later it still refused the milk. The following day, the first two 60 ml feeds were again forced, but at the third feeding the calf began to nurse, and the next day it took the nipple at the second feed. When the calf was six days old the formula was changed to two parts evaporated milk to one part water. Between days 4 and 25 it was offered milk four to five times a day at four to eight hour intervals, and intake ranged from 300–1200 ml per day. From day 31 daily feedings were gradually reduced to one or two per day and continued at this rate until it was five months old. Daily intake during this period varied from 475–950 ml per day. The calf began eating some of the hay in its stall on day 9 and by day 17 it was eating chopped fruit and vegetables together with kale, and was also drinking water.

From the point of view of making the duiker easier to handle, hand-rearing was to some extent successful although the animal never became tame and was always quite agitated when crated. It should be noted, however, that hand-reared ♂ Roe deer *Capreolus capreolus*, while quite tame as juveniles, later became very aggressive and several had to be destroyed; hand-reared ♀♀, however, were seldom later aggressive (Schmidt-Pauley & Sambraus, 1980). Hand-rearing has been observed to have the same effect on the Burma brow-antlered deer *Cervus eldi thamin* (W. Xanten, pers. comm.). Since our hand-reared ♂♂ were shipped to other zoos before they matured, we do not yet know whether this problem exists for duikers.

GROWTH AND DEVELOPMENT

Yellow-backed duikers show the rapid early weight gain typical of ungulates. Data from the two hand-reared ♂♂ and the weights of two other animals, one at birth and another at 130 days, are shown in Table 4, from which it can be seen that the weights of both ♂♂ nearly doubled between their first and fourth

DUIKER	BIRTH DATE	AGE AT WEIGHING (days)	WEIGHT (kg)
♂ (hand-reared)	10 Jan 1980	4	6.1
		14	8.3
		33	11.8
♂ (hand-reared)	26 Oct 1980	9	5.7
		14	6.4
		17	8.5
♀ (mother-reared)	23 Mar 1978	30	11.5
♀ (mother-reared)	24 Oct 1973	130	36.3
♂ (mother-reared)	24 Oct 1973	1968 (5.4 years)	79.54*

*weight at death

Table 4. Weights of four Yellow-backed duikers born at Washington NZP

weeks of life. Thus, like some of the smaller duikers (e.g. *C. dorsalis* and the Red-flanked duiker *C. rufilatus* (Dittrich, 1972)), this larger species appears to reach about 18% of the adult weight (estimated at 64 kg) by the fourth week of life. Because they come from hand-reared animals, these data should be cautiously interpreted however; we have only one birth weight available but this is equal to the weights of the hand-reared ♂♂ at four and nine days of age. The weight at 130 days represents about 57% of the adult weight and this is comparable to Dittrich's data on small duikers which show calves reaching 44–50% of the adult weight by three months of age.

At birth Yellow-backed duikers are a uniform brownish-black colour and have no horns. These first appeared in one captive ♂ at about 30 days and are known to reach a length of about 16.5 cm in both sexes (Ansell, 1950). Also from about 30 days a thin stripe of hair along the spine slowly began to lighten in colour and by 118–140 days the yellow stripe was quite obvious. Gradually, over the next four to five months, the caudal section of the stripe broadened to form the fully developed triangular patch of yellow hair from which the animal derives its common name. Our observations are similar to Ansell's (1973) description of rump patch development. Analysis of hairs collected from a two-day-old ♂ and a five-month-old ♀ showed that rump

patch hairs more than doubled in length before reaching adult size (c. 55 mm) when the calf was five months old, and crest hairs more than tripled in length over the same period. Rump patch hairs also changed colour over time; at two days the hairs were brownish-black with yellow tips and at five months were yellow with black tips. The crest hairs lightened too, from auburn to orange between birth and five months. It is worth noting that although the rump patch hair colour and length developed only gradually to the adult pattern, the piloerection response was present in very young animals.

LONGEVITY

Mentis (1972) cites two longevity records for the Yellow-backed duiker in captivity of 7 years, 4 months and 18 days, and 8 years, 11 months and 26 days. A new record has recently been set for the species at Brownsville where a ♀ duiker imported in September 1968 lived until 14 January 1979, making it at least ten years and four months old when it died (D. Thompson, pers. comm.). Our two wild-caught animals are now at least seven years old and still appear healthy.

Clearly there is still a great deal to learn about the Yellow-backed duiker. Fortunately, it now appears to be breeding well in captivity and it is hoped that our knowledge of the species will continue to expand.

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PRODUCTS MENTIONED IN THE TEXT

Carnation evaporated milk: manufactured by the Carnation Company, Los Angeles, CA 90036, USA.

Green tennis netting: a lightweight closed mesh polypropylene screen material, manufactured by BiSelco Inc., PO Box 11282, Elkins Park, PA 19117, USA.

Herbivore Zoo Chow: a pelleted product manufactured by the Ralston Purina Company, Checkerboard Square, St Louis, MO 63110, USA.

Laboratory Canine Chow: a dry dog food, manufactured by the Ralston Purina Company, Checkerboard Square, St Louis, MO 63110, USA.
Omelene 100: a sweet feed, manufactured by the Ralston Purina Company, Checkerboard Square, St Louis, MO 63110, USA.

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