

## Horn anomalies in the blackbuck antelope *Antilope cervicapra* (Linnaeus, 1758) (Mammalia: Bovidae)

Raju Vyas<sup>1\*</sup> and Kartik Upadhyay<sup>2</sup>

<sup>1</sup>Apartment, BPC-Haveli Road, Nr. Splatter Studio, Alakapuri, Vadodara – 390007, Gujarat, India

<sup>2</sup>1/101 Avni Residence, Near Bansal Super Market, Gotri Vasna Road, Vadodara, Gujarat, India

\*Corresponding author ✉: [razoovyas@hotmail.com](mailto:razoovyas@hotmail.com)

**Citation:** Vyas, R. and Upadhyay, K. (2023). Horn anomalies in the blackbuck antelope *Antilope cervicapra* (Linnaeus, 1758) (Mammalia: Bovidae). *Journal of Animal Diversity*, 5 (2): 19–24. <http://dx.doi.org/10.61186/JAD.5.2.3>

### Abstract

The blackbuck *Antilope cervicapra* (Linnaeus) is a grassland antelope widely distributed in Pakistan, Nepal, and India. Here we present a review of the known horn anomaly in the species followed by two new examples: a male with an abnormal right 'curled' horn and a female with a horn at the Blackbuck National Park, Velavadar, Bhavnagar District, Gujarat State, India. We also provide a photographic record of a female with horns in captivity.

Received: 25 February 2023

Accepted: 11 June 2023

Published online: 30 June 2023

**Key words:** Antelope, captivity, deformity, horns, nature

The blackbuck *Antilope cervicapra* (Linnaeus) is native to Pakistan, Nepal, and India (Long, 2003). Once widespread throughout the whole Indian subcontinent, it declined during the 20<sup>th</sup> century and became nearly extinct in the wild (EW) in Bangladesh, Nepal, and Pakistan (Bashistha et al., 2012). This species has been assessed as Near Threatened (NT) by the IUCN (Mallon, 2008), but now it is considered as a Least Concern (LC) by the IUCN SSC Antelope Specialist Group (2017). Furthermore, blackbuck populations were introduced to Texas, USA (Mungall, 1978), Argentina (Novillo and Ojeda, 2008), Australia, and the UAE (Mallon and Kingswood, 2001). Two subspecies of *Antilope cervicapra* are recognized: *A. c. cervicapra* (Linnaeus) from Pakistan and northwest India and *A. c. rajputanae* Zukowski, 1927 from Rajasthan, Gujarat, and part of Madhya Pradesh, India (Groves, 1980; Groves and Grubb, 2011).

The coat of the head, back, and outer legs is blackish in males and tawny or yellowish in females while the eye rings, chin patches, chest, belly, and inner legs are white in both sexes (Csurhes and Fisher, 2016; Meena and Saran, 2018). Herds range from 5 to 50 individuals of various ages and consist of an adult male and numerous females with their offspring (Isvaran, 2007). Usually, a typical blackbuck herd is led by an older female and resembles a harem in its structure (Mungall, 1978). The foraging activity

pattern depends on the seasons and temperatures of the area (Jhala and Isvaran, 2016). In the winter, blackbucks are diurnal, while during the hot season, they spend most of the day resting in shady areas, being mainly active in the morning and late afternoon (Isvaran, 2007; Jhala and Isvaran, 2016).

Male blackbucks present horns while females are devoid of them (Menon, 2014). The horns are ringed, unbranched, and corkscrew-shaped; they rise above the head in a 'V' shape (Fig. 1) and usually grow up to 79 cm long (Ranjitsinh, 1989). Horn size determines dominance rank and mating success in adult males of cervids and antelopes (Lincoln, 1994; Douhard et al., 2017). Horns are used for defense against predators and in intraspecific fights (i.e., rank fights and competition for females) (Simon et al., 2022). Among blackbucks, males with bigger horns have more chances of mating with females than males with smaller horns (Mungall, 1978; Ranjitsinh, 1989; Behera and Mohanta, 2019).

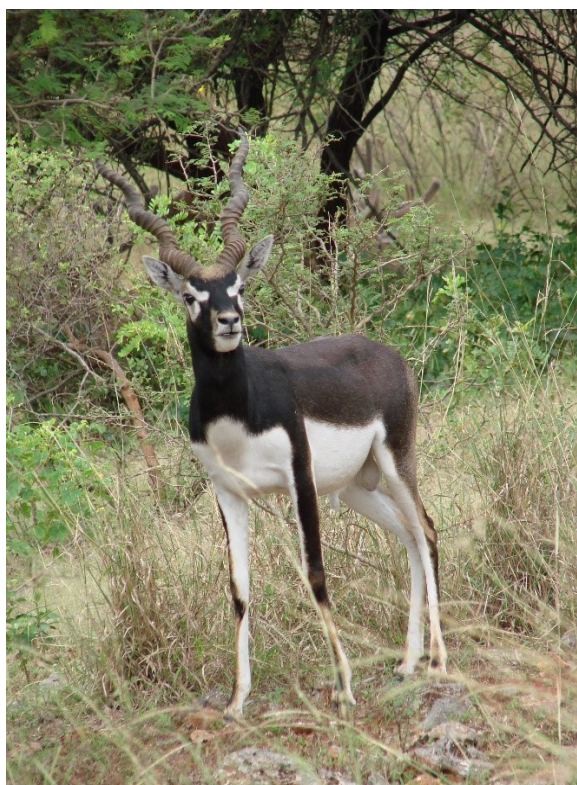
Although rare, horn abnormalities in this species have been reported since the late 19<sup>th</sup> century and it was proposed they were due to testicular injuries, and there are speculations that such horn abnormalities develop due to hormone imbalance (Jerdon, 1874). Similarly, abnormalities in the antlers of cervids often result from testicular lesions and decreased testosterone levels, inhibiting regular cycles of antler

growth (Fox et al., 2015). Mungall (1978) described six categories of horn abnormality in *A. cervicapra*: grooved tips, broken horns, compressed spiral, extended spiral, single curl, and castrated subject. Furthermore, cases of females presenting horns were recorded (Mungall, 1978). Krumbiegel (1955) stated that horned females could be fertile or sterile or hermaphrodites, depending on the hormonal levels.

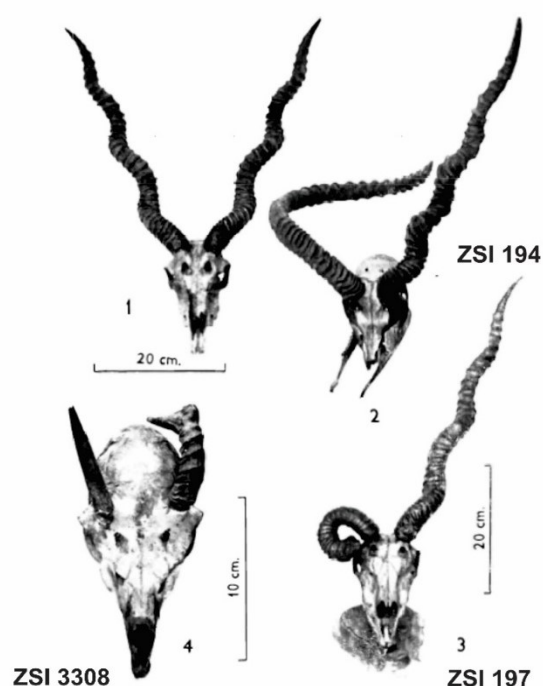
Two skulls (ZSI 194; ZSI 197) with deformed horns (Fig. 2) held in the Museum of Zoological Survey of India (Kolkata, India) were described by Mandal (1964). Both skulls feature a curved right horn; their origin and history are unknown. Earlier, four cases of females possessing horns were recorded in India. Mungall (1978) provided a brief account of records based on Jerdon (1874), including a horned female near Nagpur, Maharashtra; a skull (skull no. 1912.10.31.26) at the British Natural History Museum, London; and an anonymous record from an Indian village. In 1984, an adult female with curved horns was recorded in the Blackbuck National Park, Velavadar, Bhavnagar, Gujarat (Chauhan, 1985). Broken horns with single curl categories were recorded twice in Texas (USA) and once in India (Mungall, 1978). Horn abnormalities were

also observed in a captive stock in Gujarat, India. In 1985, the Sayajibaug Zoo in Vadodara held a blackbuck herd featuring a male with compressed spiral horns and a female with a right normal straight horn and a curved left horn (Fig. 3). Both animals were equally involved in social activities, courtship, and meetings, and the female also bred on different occasions.

More recently, on 22 March 2020 a female individual of *A. cervicapra* with a right horn devoid of spirals (Fig. 4) was sighted in the area of Kanatalav (22°4'30.92" N; 72°1'38.96" E; 35 to 40 meters a.s.l.) at the Blackbuck National Park, Velavadar, Bhavnagar District, Gujarat by a local tourist guide (Anil K. Monpariya, personal communication). On 2 February 2023, at the Blackbuck National Park (21°56' N; 71°10' E; 38 m a.s.l.) we encountered an adult male with unusual horns separate from his group (Fig 5A). The left horn had an approximately 30 cm long broken anterior part while the right one was bent with its anterior part pointing at the ground (Fig 5B). We believe this could result from a lost battle and domination from a competitor, ultimately affecting the animal's separation from the group. Such animals survive separately without any companions and do not participate in breeding with any females.



**Figure 1:** An adult male blackbuck (*Antelope cervicapra*) with standard 'V' shape ringed, unbranched corkscrew horns from the Blackbuck National Park, Velavadar, Bhavnagar District, Gujarat. (Photo Credit: Kartik Upadhyay).



**Figure 2:** Blackbuck (*Antelope cervicapra*) skulls in the possession of the Museum of Zoological Survey of India, Kolkata, India. 1) Blackbuck skull with typical horns; 2) Blackbuck skull with a right abnormal horn (ZSI 194); 3) Blackbuck skull with a right curled horn (ZSI 197); 4) Skull of Indian chinkara gazelle. (Museum registration number ZSI: after Mandal, 1964).



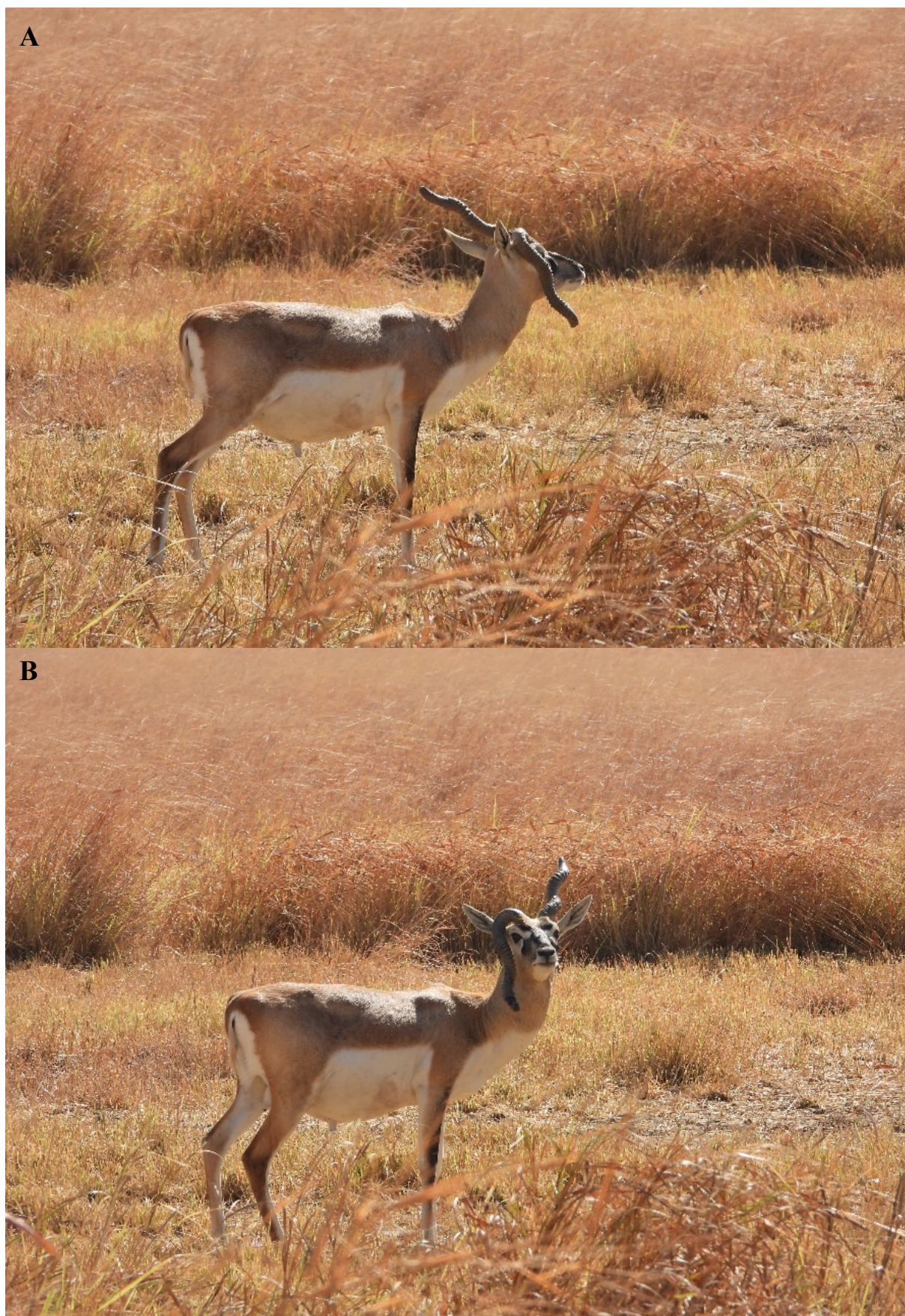


**Figure 3:** A captive female blackbuck (*Antilope cervicapra*) with horns: image archives from the Sayajbaug Zoo, Vadodara, Gujarat. (Photo Credit: Ramchandrasinji Gohil).



**Figure 4:** Female blackbuck (*Antilope cervicapra*) with horn from Kanatalav, the Blackbuck National Park, Velavadar, Bhavnagar District, Gujarat. (Photo Credit: Anil K. Monpariya, Tourist Guide).





**Figure 5:** The same male of *Antelope cervicapra* with abnormal horns from the Blackbuck National Park, Velavadar, Bhavnagar District, Gujarat: the left side horn is broken (A), the right side horn is bent (B). (Photo Credit: Kartik Upadhyay).



## Acknowledgments

We thank Mr. M. H. Trivedi, Assistant Conservator of Forest, Forest Department, Gujarat, for his extensive help with accommodations and permits. We are grateful to the Director of Zoological Survey of India, Kolkata for providing a photograph of the skull. Thanks to Anil K. Monpariya, Tourist Guide, Velavadar, for image and information sharing. We are thankful to the anonymous reviewers who reviewed the manuscript and suggested constructive changes and corrections.

## Author contributions

RV: Data review and analysis, draft preparation. KU: Field data collection from Blackbuck National Park, Velavadar, Bhavnagar District, Gujarat State, India.

## Conflict of interest

The authors declare that there are no conflicting issues related to this short communication.

## References

- Bashistha, M., Neupane, B. K. and Khanal, S. N. (2012). *Antilope cervicapra* Blackbuck in Nepal: Population status, conservation and translocation issues of Blackbuck in the blackbuck conservation area, Bardiya, Nepal. Lap Lambert Academic Publishing, London, U.K. 92 pp.
- Behera, S. K. and Mohanta, R. K. (2019). A survey of the abundance, population structure, and distribution of Blackbuck (*Antilope cervicapra*) using day ground surveys in Berhampur Forest Division, Area, Odisha. *Annals of Ecology and Environmental Science*, 3 (3): 1–4.
- Chauhan, D. R. (1985). A female blackbuck with horns. *Journal of the Bombay Natural History Society*, 82: 188.
- Csurhes, S. and Fisher, P. (2016). Blackbuck antelope, *Antilope cervicapra*. Department of Agriculture and Fisheries. Biosecurity Queensland, Australia. 13 pp.
- Douhard, M., Pigeon, G., Festa-Bianchet, M., Coltman, D. W., Guillemette, S. and Pelletier, F. (2017). Environmental and evolutionary effects on horn growth of male bighorn sheep. *Oikos*, 126 (7): 1031–1041. <https://doi.org/10.1111/oik.03799>
- Fox, K. A., Diamond, B., Sun, F., Clavijo, A., Sneed, L., Kitchen, D. N. and Wolfe, L. L. (2015). Testicular lesions and antler abnormalities in Colorado, USA Mule deer (*Odocoileus hemionus*): a possible role for epizootic hemorrhagic disease virus. *Journal of Wildlife Diseases*, 51 (1): 166–176. <https://doi.org/10.7589/2014-03-067>
- Groves, C. P. (1980). A note on geographic variation in the Indian Blackbuck (*Antilope cervicapra* Linnaeus, 1758). *Record of Zoological Survey of India*, 76: 125–138. <https://doi.org/10.26515/rzsi/v76/i1-4/1980/161869>
- Groves, C. and Grubb, P. (2011). *Ungulate taxonomy*. Johns Hopkins University Press, Baltimore, Maryland, USA. 317 pp. <https://doi.org/10.56021/9781421400938>
- Isvaran, K. (2007). Intra specific variation in group size in the blackbuck antelope: the role of habitat structure and forage at different spatial scales. *Oecologia*, 154 (2): 435–444. <https://doi.org/10.1007/s00442-007-0840-x>
- IUCN SSC Antelope Specialist Group. (2017). *Antilope cervicapra*. The IUCN Red List of Threatened Species 2017: e.T1681A50181949. (Accessed 30 May 2023). <https://doi.org/10.2305/IUCN.UK.2017-2.RLTS.T1681A50181949.en>
- Jerdon, T. C. (1874). *The mammals of India*. John Wheldon, London, UK. 335 pp.
- Jhala, Y. V. and Isvaran, K. (2016). Behavioural ecology of a grassland antelope, the Blackbuck *Antilope cervicapra*: linking habitat, ecology and behavior, In: Ahrestani, F. and Sankaran, M. (Eds.), *The ecology of large herbivores in South and Southeast Asia*. Springer Nature Publication, Dordrecht. pp. 151–176. [https://doi.org/10.1007/978-94-017-7570-0\\_6](https://doi.org/10.1007/978-94-017-7570-0_6)
- Krumbiegel, I. (1955). *Biologie der Saugetier*, II. Agis-Verlag, Krefeld, Germany. 844 pp.
- Lincoln, G. A. (1994). Teeth, horns and antlers: The weapons of sex, In: Short, R. V. and Bulaban, E. (Eds.), *The difference between the sexes*. Cambridge University Press, Cambridge, UK. pp. 131–158.
- Long, J. L. (2003). *Introduced mammals of the world: their history, distribution and influence*. CSIRO Publishing, Collingwood, Australia. 487 pp. <https://doi.org/10.1071/9780643090156>
- Mallon, D. P. (2008). *Antilope cervicapra*. IUCN Red List of Threatened Species. IUCN. Version 2017-1. Available at: [www.iucnredlist.org](http://www.iucnredlist.org). Accessed 18 February 2023.
- Mallon, D. P. and Kingswood, S. C. (2001). Antelopes. Part 4: North Africa, the Middle East, and Asia. Global Survey and Regional Action Plans. SSC Antelope Specialist Group. International Union for Conservation of Nature (IUCN). Gland, Switzerland and Cambridge, UK. pp. 7–249.
- Mandal, A. K. (1964). Some abnormal antlers and horns of deer and antelopes in the collections of Zoological Survey of India. *Records of Zoological Survey of India*, 62 (3–4): 223–226. <https://doi.org/10.26515/rzsi/v62/i3-4/1964/161639>

- Meena, R. and Saran, R. P. (2018). Distribution, ecology and conservation status of blackbuck (*Antelope cervicapra*): An update. *International Journal of Biology Research*, 3: 79–86.
- Menon, V. (2014). *Indian mammals: A field guide*. Hachette Book Publishing (India) Pvt. Limited, Gurgaon, India. 406 pp.
- Mungall, E. C. (1978). *The Indian Blackbuck Antelope: A Texas View*. The Caesar Kleberg Research Program in Wildlife Ecology. The Texas Agr. Expt. Station, Texas A and M University System, College Station, Texas. 184 pp.
- Novillo, A. and Ojeda, R. A. (2008). The exotic mammals of Argentina. *Biological Invasions*, 10: 1333–1344. <https://doi.org/10.1007/s10530-007-9208-8>
- Prasad, N. L. N. S. (1983). Horn growth in blackbuck. *Journal of the Bombay Natural History Society*, 80: 634–635.
- Ranjitsinh, M. K. (1989). *The Indian Blackbuck*. Natraj Publishers, Dehra Dun, India. 155 pp.
- Simon, R., Drögemüller, C., and Lühken, G. (2022). The complex and diverse genetic architecture of the absence of horns (Polledness) in domestic ruminants, including goats and sheep. *Genes*, 13 (5): 832. <https://doi.org/10.3390/genes13050832>