B A N I S T E R I A

A JOURNAL DEVOTED TO THE NATURAL HISTORY OF VIRGINIA

ISSN 1066-0712

Published by the Virginia Natural History Society

The Virginia Natural History Society (VNHS) is a nonprofit organization dedicated to the dissemination of scientific information on all aspects of natural history in the Commonwealth of Virginia, including botany, zoology, ecology, archaeology, anthropology, paleontology, geology, geography, and climatology. The society's periodical *Banisteria* is a peer-reviewed, open access, online-only journal. Submitted manuscripts are published individually immediately after acceptance. A single volume is compiled at the end of each year and published online. The Editor will consider manuscripts on any aspect of natural history in Virginia or neighboring states if the information concerns a species native to Virginia or if the topic is directly related to regional natural history (as defined above). Biographies and historical accounts of relevance to natural history in Virginia also are suitable for publication in *Banisteria*. Membership dues and inquiries about back issues should be directed to the Co-Treasurers, and correspondence regarding *Banisteria* to the Editor. For additional information regarding the VNHS, including other membership categories, annual meetings, field events, pdf copies of papers from past issues of Banisteria, and instructions for prospective authors visit **http://virginianaturalhistorysociety.com/**

Editorial Staff: Banisteria

Editor

Jackson C. Means
Virginia Museum of Natural History
21 Starling Avenue
Martinsville, Virginia 24112

Associate Editors

Philip Coulling, Nature Camp Incorporated
Clyde Kessler, Virginia Tech
Nancy Moncrief, Virginia Museum of Natural History
Karen Powers, Radford University
Stephen Powers, Roanoke College
C. L. Staines, Smithsonian Environmental Research Center

Copy Editor

Kal Ivanov, Virginia Museum of Natural History

Copyright held by the author(s). This is an open access article distributed under the terms of the Creative Commons, Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.
http://creativecommons.org/licenses/by/4.0/

Banisteria 61: N15–19
© 2026 Virginia Natural History Society

SHORTER CONTRIBUTIONS

WHITE-TAILED DEER (*ODOCOILEUS VIRGINIANUS* [ZIMMERMANN, 1780]) WITH ABERRANT SILVER PELAGE

KAREN E. POWERS

Biology Department, Radford University, Radford, Virginia 24142, USA

Corresponding author: Karen E. Powers (*kpowers4@radford.edu*)

Editor: J. C. Means | Received 14 September 2026 | Accepted 27 October 2026 | Published 16 November 2026

https://virginianaturalhistorysociety.com/2026/01/14/number-61-2026/

Citation: Powers, K. E. 2026. White-tailed deer (*Odocoileus virginianus* [Zimmerman, 1780]) with aberrant silver pelage. Banisteria 61: N15–19.

ABSTRACT

In Ellett Valley (eastern Blacksburg, Montgomery County, Virginia), I discovered a white-tailed deer (*Odocoileus virginianus*) with aberrant coloration. The adult buck was lightly pigmented, presenting with primarily silvery pelage. His rump and dorsal side of the tail and hind legs were variably spotted with solid white patches. This buck was imaged on 19 August 2026 and again on 20 August 2026. The mechanism underlying this coloration is unknown, and the silver pelage does not clearly fit descriptions of albinism, melanism, leucism, or piebaldism. The localized white patches may be consistent with piebaldism, whereas the widespread silver coloration could reflect altered melanin production, pigment distribution, or hair structure; the underlying mechanism remains undetermined.

Keywords: Aberrant coloration**,** buck, melanin, piebaldism, pigment dilution.

On 19 and 20 August 2026, I observed and imaged a male white-tailed deer (*Odocoileus virginianus* [Zimmermann, 1780]) in a fallow field on Clubhouse Road, Blacksburg in Montgomery County's Ellett Valley (37.211583 °N, 80.359950 °W). This privately-owned field abuts the North Fork of the Roanoke River and is bordered by the 2-lane Clubhouse Road. As one of three bucks grouped in the field, this silvery buck was an adult with 8-pt antlers in velvet; the other two bucks were subadults and of typical pelage colorations (Fig. 1A-C). The adult buck exhibited a primarily silver pelage with faded patches of the more typical reddish-brown summer pelage coloration. His rump was a patchwork of solid white and light reddish-brown, and additional atypical patches of white appeared on his flanks and tail. His legs appeared reddish-brown-tinted throughout, although the inner hocks presented with more white hairs, like typical white-tailed deer. Although white-tailed deer exhibit a grayish winter coat, this combination of features did not match that seasonal change.



Figure 1. Images of *Odocoileus virginianus* (white-tailed deer) with silver and white pelage on 19 August 2026 from Montgomery Co., Virginia. Individual's images presented at three angles: (A) head and neck; (B) hind legs and rump; and (C) dorsal/lateral sides. Both (B) and (C) include a spike buck in the background of the image, exhibiting white-tailed deer with typical pelage coloration. Photos by S. Powers.

Large-scale studies of deer pelage abnormalities recognize true albinism, leucism, melanism, and piebaldism. In some forms of albinism, mutations in the TYR gene impair tyrosinase activity and consequently reduce or prevent melanin synthesis, even though melanocytes may still be present (King et al., 2003; Grønskov et al., 2007). Complete albinism commonly results in white pelage and reduced ocular pigmentation. Leucism describes partial or extensive loss of pigmentation in the coat, often with normally pigmented eyes (Cotts et al., 2024). However, they can present with a fully white pelage, as stable fully-leucistic herds exist in Vilas Co., Wisconsin (pers. obs.), Seneca Co., New York (York, 2004), and likely other unreported locales. These individuals typically possess white or blond pelage and brown eyes. Melanistic deer overproduce pigments, and typically are black or dark gray (e.g., D'Angelo & Baccus, 2007; Cotts et al., 2024). Though suspected to be less common than albinism, local hotspots of deer melanism exist. In Texas, Baccus & Posey (1999) documented rates of up to 22.5% of sighted deer as melanistic. Piebaldism involves localized areas of unpigmented hair, often associated with differences in melanocyte distribution or function (e.g., Silvers, 1961; Ryel, 1963). In Ryel's (1963) study of over 30,000 deer harvested in Michigan over a 3-y timeframe, just 20 were identified as albino or piebald. Across a wider geographic range, piebald individuals comprise less than 1% of wild white-tailed deer across their range (Keller, 2017), but percentages can reach as high as 8.5% locally (e.g., Texas; Baccus & Posey, 1999). Piebald white-tailed deer are occasionally reported in Virginia, and this buck's rump may be explained by this abnormality. However, the silver coloration is absent in typical piebald deer. This buck did not exhibit the skeletal abnormalities sometimes reported in piebald deer, such as a hooked nose, curved spine, or shortened legs (Miller et al., 2004); however, their absence does not exclude piebald coloration. Miller et al. (2004) described grayish winter pelage; because these photographs were taken in August, seasonal molt may play a part in this unusual pelage, although it may not fully explain the unusual pattern. For example, this individual buck lacks the shaggy or patchy fur and raggedness of his pelage– features often apparent in the fall molting process.

To our knowledge, the unusual silver pelage observed in this deer has not been definitively associated with a specific pigmentation disorder in scientific literature. Axanthism, characterized by reduced or absent yellow pigmentation, has been documented in amphibians and reptiles (Jablonski et al., 2014; Allain et al., 2023). However, whether a similar pigmentation mechanism explains silver pelage in mammals remains unknown. Mammalian hair color depends largely on the relative amounts of eumelanin and pheomelanin and their distribution within individual hairs (Lamoreux et al., 2001; Hoekstra, 2006).

This trend has been well-studied in herpetofauna (e.g., Jablonski et al., 2020; Allain et al., 2023) but less so in wild mammals. Silver and platinum pelages in captive and wild deer mice (*Peromyscus maniculatus* [Wagner, 1845]) are attributed to recessive genes that dilute or incorrectly distribute the pigment expression on the hairs (Dodson et al., 1987). Similarly, laboratory house mice (*Mus musculus* L., 1758) with silver or "chinchilla" pelage produce a non-typical amount of melanin due to incomplete functioning of the TYR gene. The TYR gene encodes tyrosinase, an enzyme essential to melanin synthesis (Lamoreux et al., 2001). In mustelids, captive American mink (*Neogale vison* [Schreber, 1777]) can present with a gray or "sapphire" coat color (Cotts et al., 2024). Greying in domestic horses (*Equus caballu*s L., 1758) is reportedly caused by a mutation in the STX17 gene and reflects the individual's pace at transitioning to a grayer coat color over time (Andersson, 2024).

Comparative studies of mammalian coat coloration indicate that unusual pelage phenotypes can result from changes in eumelanin or pheomelanin production, pigment

concentration, or the distribution of pigment within individual hairs (Dodson et al., 1987; Lamoreux et al., 2001; Hoekstra, 2006). Although these mechanisms could contribute to the silver coloration observed in this deer, its underlying cause remains unknown.

Other individuals with similar silver appearances were colloquially called “ghost deer” or “frosty whitetails” by the National Deer Association (Thomas Jr., 2025). Thomas Jr. (2025) postulated that silver white-tailed deer are not a result of muted melanism alone, but that piebaldism also is evident. These ghost deer often contain the residual white patches (piebaldism) I also observed on this Virginia buck. Thomas Jr. (2025) described similarly colored deer; the interpretation of their pigmentation mechanism should be checked against the original article rather than treated as established. The white patches and widespread silver coloration may represent distinct manifestations of altered pigmentation, but photographs alone cannot determine whether they share a cause.

The effect of this unusual pelage on survival is unknown. Survival thus far does not establish the absence of fitness costs. Our observations do not allow conclusions about predation risk. Its unusual appearance may attract attention from hunters, but any effect on harvest risk is speculative. Repeated observations across seasonal molts could establish whether the silver coloration persists, but absence of sightings would not establish the animal’s fate. Because only photographs were available, future opportunistic sampling could examine pigment distribution along individual hair shafts, evaluate eumelanin and pheomelanin, and, where suitable material is available, investigate pigmentation-related genetic variants. Hair-shaft appearance alone cannot establish melanocyte distribution in the skin.

ACKNOWLEDGEMENTS

I thank S. Powers for serving as the primary photographer for this event. This observation and project received no external funding.

REFERENCES

Allain, S., D. Clemens, & O. Thomas. 2023. Taste the rainbow: A review of color abnormalities affecting the herpetofauna of the British Isles. Reptiles & Amphibians,30(1): e18470. https://doi.org/10.17161/randa.v30i1.18470

Andersson, L. 2024. White horses – non-coding sequences drive premature hair greying and predisposition to melanoma. Upsala Journal of Medical Sciences 129: e10626. https://doi.org/10.48101/ujms.v129.10626.

Baccus, J. T., & J. C. Posey. 1999. Melanism in white-tailed deer in central Texas. Southwestern Naturalist 44(2): 184–192.

Cotts, L., G. Costa, S. I. Gabrie, O. Rocha Barbosa, & C. Braga. 2024. Unveiling the colors of Mustelids: A historical review on the emergence of chromatic disorders and their ecological effects in Mustelids worldwide with report of the first case of erythrism in *Eira barbara* (Carnivora, Mustelidae). Animals 14(23): 3354. https://doi.org/10.3390/ani14233354

D'Angelo, G. J., & J. T. Baccus. 2007. First record of melanistic white-tailed deer in Pennsylvania. American Midland Naturalist 157(2): 401–403.

Dodson, K. M., W. D. Dawson, S. O. VanOoteghem, B. S. Cushing, & G. R. Haigh. 1987. Platinum coat color locus in the deer mouse. Journal of Heredity 78: 183–186.

Grønskov, K., J. Ek, & K. Brondum-Nielsen. 2007. Oculocutaneous albinism. Orphanet Journal of Rare Diseases 2: 43. https://doi.org/10.1186/1750-1172-2-43.

Hoekstra, H. E. 2006. Genetics, development and evolution of adaptive pigmentation in vertebrates. Heredity 97(3): 222–234.

Jablonski, D., A. Alena, P. Vlček, & D. Jandzik, D. 2014. Axanthism in amphibians: A review and the first record in the widespread toad of the *Bufotes viridis* complex (Anura: Bufonidae). Belgian Journal of Zoology 144: 93–101.

Keller, D. 2017. Whitetail Deer Facts and Strategies. Page Publishing, Meadville, PA. 146 pp.

King, R. A., J. Pietsch, J. P. Fryer, S. Savage, M. J. Brott, I. Russell-Eggitt, C. G. Summers, & W. S. Oetting. 2003. Tyrosinase gene mutations in oculocutaneous albinism 1 (OCA1): Definition of the phenotype. Human Genetics 113: 502–513.

Lamoreux, M. L., K. Wakamatsu, & S. Ito. 2001. Interaction of major coat color gene functions in mice as studied by chemical analysis of eumelanin and pheomelanin. Pigment Cell Research 14: 23–31.

Miller, K. V., L. L. Muller, & S. Demarais. 2004. White-tailed Deer. Pp, 906–930 In G. A. Feldhamer, B. C. Thompson, & J. A. Chapman (eds.), Wild Mammals of North America: Biology, Management, and Conservation (2nd edition). Johns Hopkins University Press, Baltimore, MD.

Ryel, L. A. 1963. The occurrence of certain anomalies in Michigan white-tailed deer. Journal of Mammalogy 44(1): 79–98.

Silvers, W. K. 1961. Genes and the pigment cells of mammals: Pigment cells provide unique material for studying the interactions of genetic determinants. Science 134(3476): 368–373.

Thomas Jr., L. 2025. This “frosty” silver buck has biologists stumped. See the photos. National Deer Association. https://deerassociation.com/this-frosty-silver-buck-has-biologists-stumped-see-the-photos/ (Accessed 8 September 2026).

York, M. 2004. Nurtured at army depot, rare deer herd is suggested as a key to tract's future. New York Times. March 21, 2004. P. N31 (Accessed 8 September 2026).