Short Note

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First photographic record of albinism in Baiomys taylori (Rodentia: Cricetidae)

https://doi.org/10.1515/mammalia-2021-0120
Received June 25, 2021; accepted November 10, 2021;
published online January 7, 2022

Abstract: Cases of albinism have been reported in less than 2% of living rodent species. Here, we report the first description of complete albinism in *Baiomys taylori* along with photographic evidence. This adult female was captured on three occasions as part of a long-term small mammal study on rangelands of extreme southern Texas. The individual was developing teats upon the third capture, an early sign of pregnancy. Despite selective pressures against albino phenotypes, this animal was able to survive to adulthood and potentially pass its albino alleles to offspring.

Keywords: mate choice; melanin; Neotominae; northern pygmy mouse; pigmentation.

Albinism is defined as the complete absence of melanin in an animal's skin, hair, and eyes, resulting in red eyes, white hair, and pink or white skin (Fertl and Rosel 2018; Romero et al. 2018). Unlike other pigment disorders that affect melanin deposition, albinism produces nonfunctional melanosomes that prevent these organelles within pigment cells from producing any melanin altogether (Lamoreux et al. 2010). A variety of genetic mutations can cause albinism, and although these have been extensively studied in captive animals (Levine and Krupa 1966), actual instances of albinism and its potential consequences for survival are poorly documented in wild mammals, especially rodents (Romero et al. 2018). As a general rule, albino individuals are thought to face strong negative selection due to lack of camouflage and possible vision abnormalities inherent with albinism (Creel 1980; Fertl and Rosel 2018). However, the deleterious effects of albinism may also vary across species and may account for it being more or less frequently encountered in certain taxa. For example, within Cricetidae (the second-most speciose mammal family), complete albinism has only been documented in 22 of approximately 600 species (Romero et al. 2018; Stumpp et al. 2019). Here, we provide the first detailed description and photographs of albinism in *Baiomys*, a genus of small cricetid mice found in grasslands from Texas through Central America (Packard and Montgomery 1978; Schmidly and Bradley 2016).

On 16 March 2021, we trapped an albino specimen of northern pygmy mouse (*Baiomys taylori*) while performing mark-recapture surveys for small mammals on the East Foundation's San Antonio Viejo Ranch (SAVR) in Jim Hogg County, Texas (26.936885, −98.700284; Figure 1). The animal was captured with a 10.16 × 11.43 × 38.1 cm Sherman live-trap in a mid-successional grassland predominated by little bluestem (*Schizachyrium scoparium*) and mesquite (*Prosopis glandulosa*) (Figure 2).

Whereas typical *B. taylori* possess dark eyes, brownish-gray grizzled fur, and brown to purplish skin, this animal's entirely white fur, deep pink skin on its limbs and tail, unpigmented whitish ears, and red to maroon-colored eyes suggested complete albinism (Figure 3). To our knowledge, this is the second documented case of albinism in *Baiomys* and the first to contain a description with photographic evidence. Stickel and Stickel (1949) incidentally reported a male albino *B. taylori* in an unburnt, ungrazed prairie at Joint Base Camp Bullis, Texas (306 km N of SAVR; Figure 1), but did not provide further details aside from a note about capturing this animal by hand.

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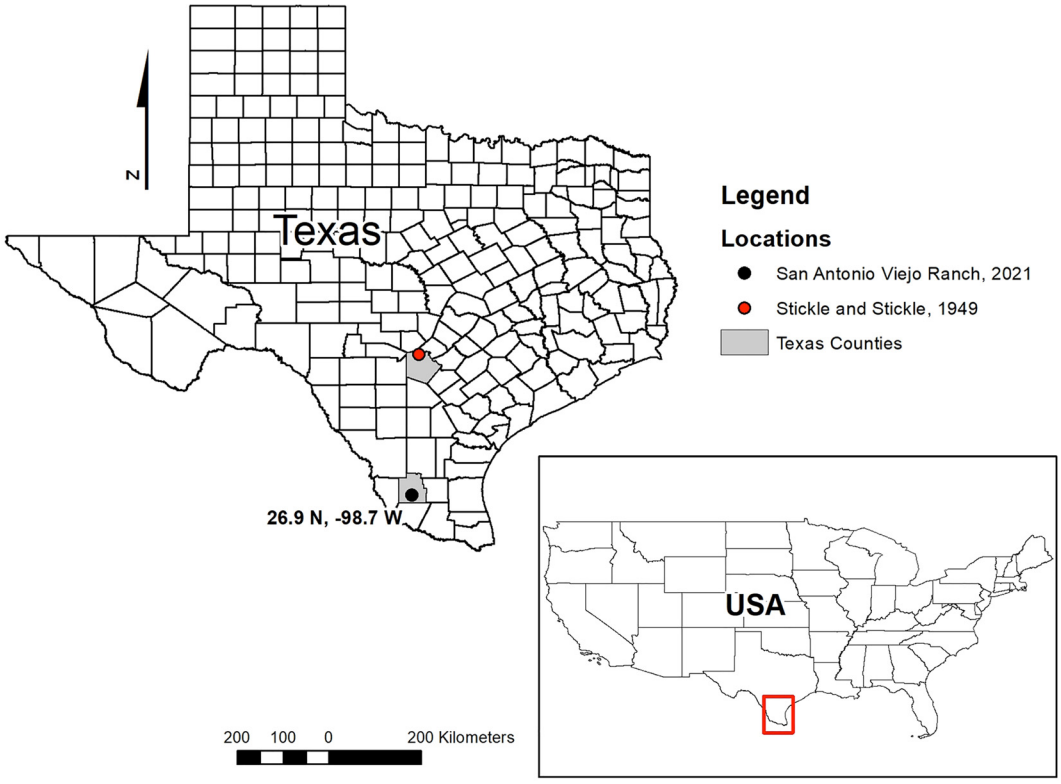

Figure 1: Locations of captured albino *Baiomys taylori* from the San Antonio Viejo Ranch, Jim Hogg County, Texas, USA, 2021 (this study) and Stickel and Stickel (1949).

The individual we captured weighed 7.5 g and appeared to be a nonreproductive adult female at the time of the first capture (16 March 2021), as suggested by its weight and lack of developed teats (Schmidly and Bradley 2016). Its total length was 95 mm, tail length 41 mm, hindfoot 13.5 mm, and ear length 9 mm. As part of our mark-recapture protocol, we colored the ventral surface with Sharpie markers and noted the age, sex, and reproductive status of the individual. We recaptured the individual at the same trap the following day (second and third days of a five-day trapping effort). To obtain photographic evidence and measurements, we set another 25 traps within a 10-m radius from the original trap location on 2 April 2021 and successfully recaptured this individual approximately 5 m away from the original location. At this time, its teats had become noticeable, implying sexual maturity and pregnancy.

Baiomys taylori breeds year-round, young are weaned 18–22 days after birth, and sexual maturity is attained at the age of about 60 days (Schmidly and Bradley 2016). Based on this information, we calculate that this individual survived independently for a minimum of 38–42 days after being weaned. Nevertheless, our observation says little about whether its survival during this period was brought on by chance versus other ecological factors. Among wild vertebrates, the overall scarcity of albinism and other pigment mutations is thought to be caused by selection against these traits. In some animals, the greater frequency of albino juveniles versus adults serves as evidence for this type of selection (Slagsvold et al. 1988). However, Stickel and Stickel (1949) and this study recorded albinism in adults, and in our case, a reproductively active individual.

One possible explanation for albino *B. taylori* surviving to adulthood may be the species' preference for sites with dense, matted grass cover (Schmidly and Bradley 2016) that would conceal them regardless of their fur color and offset their visibility to potential predators. Although no information exists on survivorship and recruitment for abnormally-colored *Baiomys*, a field experiment in Ohio involving another cricetid rodent with similar habitat affinities (meadow vole, *Microtus pennsylvanicus*) came to this conclusion after finding similar population growth between normal and albino *Microtus* in areas with thick vegetation (Peles et al. 1995). Alternatively, the grassland where we found the albino *B. taylori* may contain ample resources and low predator

Figure 2: Habitat in which the albino *B. taylori* was captured on the San Antonio Viejo Ranch, Jim Hogg County, Texas, USA on three separate occasions (16 March 2021, 17 March 2021, and 2 April 2021).

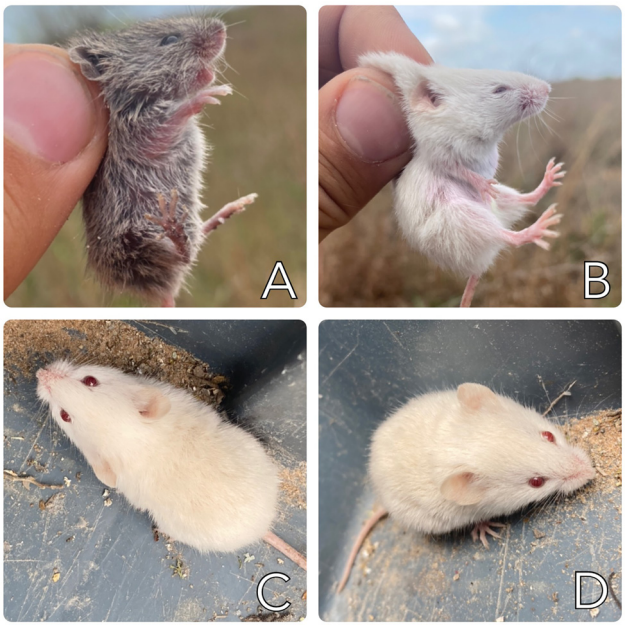

Figure 3: Photographic evidence of an albino *Baiomys taylori* caught on the San Antonio Viejo Ranch, Jim Hogg County, Texas, USA on 16 March 2021, 17 March 2021, and 2 April 2021.
A: Side view of a normal-pigmented *B. taylori*. B: Side view of albino *B. taylori* showing deep pink limbs and skin. C: Top view of albino *B. taylori* with red eyes visible. D. Front view from above of albino *B. taylori*.

abundance, allowing mice with deleterious traits to persist longer than they normally would. Regardless, albinism in *B. taylori* must be rare, as this animal represents a first among 3942 *Baiomys* (approximately 0.025% of sampled individuals) captured on East Foundation properties over a seven-year period.

Predation risks aside, albinism is rare by its association with other deleterious traits (Møller and Mousseau 2001) and sexual selection that potentially disfavors albino individuals (Blohowiak and Siegel 1985). For these reasons, the pregnant state of this albino *B. taylori* is somewhat noteworthy, even if a single observation says little about mate choice within this species.

In conclusion, our observation not only provides the first photographic record of albinism in *Baiomys* but also raises questions of whether this particular individual would produce albino offspring, whether the mutation responsible for its appearance is similar to those found in other albino rodents, and whether male *Baiomys* consider fur color when choosing a mate. Future studies on the genetics, survivorship, and intraspecific interactions of albino Cricetidae are thereby warranted.

Research ethics: All animals were collected in accordance with Texas Parks and Wildlife Department authorized scientific collection permit (SPR-1218-309) and Texas A&M University Institutional Animal Care and Use Committee (AUP 2016-0296).

Acknowledgments: We thank East Foundation for funding their long-term study of small mammals and the 2021 East Foundation monitoring crew for ensuring the continuation of this project. In particular, we thank Grace Hershberg for her initial discovery and handling of this rodent. This is manuscript number 69 of the East Foundation.

Author contributions: All authors conceived the project and collaborated on the writing of the paper.

Research funding: This research was funded by the East Foundation.

Conflict of interest statement: All authors have declared no conflict of interest regarding this paper.

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