



11-4-2014

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Recommended Citation

Camargo, Issac; Rios, Evelyn; Cornejo-Latorre, Cristian; and Álvarez-Castañeda, Sergio Ticul (2014) "First record of leucism in the genus *Peromyscus* (Mammalia: Rodentia)," *Western North American Naturalist*. Vol. 74 : No. 3 , Article 12.

Available at: <https://scholarsarchive.byu.edu/wnan/vol74/iss3/12>

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FIRST RECORD OF LEUCISM IN THE GENUS *PEROMYSCUS* (MAMMALIA: RODENTIA)

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and Sergio Ticul Álvarez-Castañeda^{1,2}

ABSTRACT.—Leucism is a partial hypopigmentary congenital disorder previously recorded in several species of mammals. This abnormal coloration is unusual in the wild. In August 2013, in Baja California, México, we collected 2 *Peromyscus fraterculus* (one female and one male) exhibiting leucism. Leucism has not been previously reported in the genus *Peromyscus*; therefore, we documented the first known record. Leucism is expressed in natural populations having low genetic diversity and may increase selective pressure on affected individuals.

RESUMEN.—El leucismo es un desorden hipopigmentario congénito que ha sido descrito en varias especies de mamíferos. Esta coloración anormal es inusual en poblaciones silvestres. En agosto de 2013, colectamos 2 individuos de *Peromyscus fraterculus* (una hembra y un macho) con leucismo, en Baja California, México. El leucismo no había sido reportado en el género *Peromyscus*, por lo cual, nosotros documentamos el primer registro conocido. El leucismo refleja bajos niveles de diversidad genética en las poblaciones naturales. Esta característica puede incrementar la presión selectiva en los individuos que la presentan.

Atypical coloration can occur in mammals when melanin is excessive or deficient in all or part of the pigment bodies. Albinism is rare among wild animals; only one in twenty thousand individuals expresses this anomaly (Walter 1938), which is characterized by the total deficiency of melanin in eyes, skin, and hair. Cases in which melanin is reduced or absent in only some pigment bodies are called incomplete, imperfect, or partial albinism depending on the pattern (Alaja and Mikkola 1997). Leucism is a form of partial albinism in which individuals exhibit a white color but retain typical coloring in the eyes, nails, and skin (Sage 1962, Forrest and Naveen 2000, Miller 2005, García-Morales et al. 2012). Leucism is controlled by a single recessive allele, and its occurrence is associated with environmental factors, such as low-quality habitat, low-quality diet (Owen and Shimmings 1992, Peles et al. 1995), pollution (Moller and Mousseau 2001), or follicular damage (Phillips 1954, Hafner and Hafner 1987). Individuals with partial leucism are more frequent in small and isolated populations because endogamy causes recessive alleles to be expressed (Holyoak 1978, Bensch et al. 2000). Leucistic individuals have lower survival rates than normally colored

individuals, because they are more easily detected by predators (Owen and Shimmings 1992).

In the order Rodentia, many cases of anomalous coloration have been reported in genera such as *Microtus* (Peles et al. 1995, Brewer et al. 1993), *Myodes* (Whitman 2009), *Ondatra* (Benton 1953), *Reithrodontomys* (Egoscue 1958), *Perognathus* (Egoscue and Lewis 1968), *Mus musculus* (Winston and Lindzey 1964), *Otomys* (Pirlot 1958), *Rattus* (El-Bakry 2010), *Ammospermophilus* (Neal 1964), *Citellus* (Turkowski and Parker 1967), *Funambulus* (Mahabal et al. 2005), *Sciurus* (Hoeskstra 2004), *Tamias* (Guiles 1997), *Thomomys* (Burnet 1925), and *Dasyprocta* (Oliveira 2009). But in *Peromyscus*, which is the most species-rich genus in North America, neither albinism nor leucism have been reported in the wild.

Two leucistic individuals of *Peromyscus fraterculus* were collected in the northern Baja California peninsula in the San Telmo area, Baja California, México. These specimens were associated with coastal scrub vegetation, where rosette succulents are a dominant vegetative element. Additional abundant species in the area were *Agave shawii* var. *shawii*, *Ambrosia chenopodiifolia*, *Hazardia*

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Fig. 1. Leucistic adult female (CIB 22913) collected in the northern Baja California peninsula (7 km N, 1.3 km W San Telmo, Baja California, México; 31.0247° N, 116.0553° W).

rosarica, *Hazardia vernicosa*, *Euphorbia misera*, *Bergerocactus emoryi*, *Myrtillocactus cochal*, and *Stenocereus gummosus* (Garcillán et al. 2012).

An adult female (CIB 22913) was collected on 17 August 2003, 7 km N, 1.3 km W of San Telmo (31.0468° N, 116.1164° W). The next day on 18 August 2003, an adult male (CIB 22918) was collected 5.5 km N, 33 km E of San Telmo (31.0247° N, 116.0553° W). Both specimens have white spots on the face, near the ears, and on the nape, and the male has white spots on the right side of the body (Fig. 1). The specimens are housed in the Mammal Collection of the Centro de Investigaciones Biológicas del Noroeste. These organisms were associated with other mammal species such as *Peromyscus maniculatus*, *Neotoma bryanti*, *Chaetodipus fallax*, and *Dipodomys simulans*. This is the first reported case of leucism in *Peromyscus*, and it could be signal of a low genetic variability in the population of *P. fraterculus* from the San Telmo area.

Observation of color abnormalities among wild mammals is an isolated event because these abnormalities are rare (Robinson 1973, Caro 2005). Genetic leucism has most likely been unreported in *Peromyscus* because of the genus' wide distribution in North America and its high degree of adaptability to different habitats. The biological interpretation of leucism occurrences is not clear; however, it is

known that these atypical patterns provide indirect information about genetic variability within populations (Jehl 1985). The discovery of leucistic adult animals is interesting from the standpoint of genetic and ecological theory because these individuals are more likely to be detected by predators and are thus less likely to survive. No physiological disadvantages have been associated with leucism. Therefore, it would be important to follow-up with *P. fraterculus* to analyze patterns of genetic diversity within and among populations.

We thank A. Rodríguez-Silva and D. Santos for their assistance in the field. Financial support was generously provided by the Comisión Nacional para el Conocimiento y Uso de la Biodiversidad (JF209) and the Consejo Nacional de Ciencia y Tecnología (151189).

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Received 4 December 2013

Accepted 28 July 2014