

# First record of leucism in brown pelicans (*Pelecanus occidentalis*) in Costa Rica

## Primer registro de leucismo en el pelicano pardo (*Pelecanus occidentalis*) en Costa Rica

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### ABSTRACT

Leucism in birds is rarely observed in the Pelecaniformes order and has not been recorded for the brown pelican (*Pelecanus occidentalis*) in Costa Rica. We describe an observation of a leucistic brown pelican with white plumage, pink coloration on the bill and feet, but normal color on the eyes. Leucism in birds is the most frequently reported color aberration and these cases present low survival rates for individuals. Although isolated cases occur in birds, these reports help determine the frequency of these events for specific bird populations and species.

**Keywords:** Leucism, brown pelican, plumage, albinism, Costa Rica.

### RESUMEN

El leucismo en las aves se observa raramente en el orden Pelecaniformes y no ha sido registrado para el pelicano pardo (*Pelecanus occidentalis*) en Costa Rica. Describimos una observación de un pelicano marrón leucístico con plumaje blanco, coloración rosa en el pico y las patas, pero color normal en los ojos. El leucismo en las aves es la aberración de color más frecuentemente reportada y estos casos presentan tasas bajas de supervivencia para los individuos. Aunque se presentan casos aislados en aves, estos reportes permiten determinar la frecuencia de estos eventos en ciertas poblaciones y especies de aves.

**Palabras claves:** Leucismo, pelicano pardo, plumaje, albinismo, Costa Rica.

### INTRODUCTION

Birds obtain their coloration from pigments or refractive structures in feathers and skin (Yusti-Muñoz & Velandia-Perilla, 2013). The principal pigments present in birds are melanins that are classified into pheomelanins, which produce brown and rufous colors, eumelanins, which produce dark brown, grey and black, and carotenoids which are extracted from food and produce reddish, orange and yellow colors (Rodríguez-Pinilla & Gómez-Martínez, 2011).

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The occurrence of abnormal colorations is attributed to gene mutations or differences in gene expression, which affect the production of pigments such as melanins (Torres & Franke, 2008). Total albinism is defined as the complete absence of pigments in feathers, bill, legs and iris while partial albinism (leucism) is the absence of pigments (symmetric or not) in some parts of the body or group of feathers (Davis, 2007; Sibley, 2011).

Cases of abnormal coloration in birds are relatively rare including the Pelecaniformes order (Gross, 1965; Nesbitt, 1979; Post, 2012). However, abnormal color cases are common in domesticated birds, while cases in natural populations are rarely observed and seem to exist differences in frequency between families, but there is no research to support it yet (van Grouw, 2006; Sibley, 2011; Post, 2012).

The brown pelican (*Pelecanus occidentalis*) is distributed from the northern Pacific coast of the United States to northern Peru as well as the Atlantic Ocean, Gulf of Mexico and the Caribbean coast where it is found in both coastal areas and islands (Stiles & Skutch, 2007; Shields, 2002; Peterson, 2008; Tanglely, 2009). *P. occidentalis* has been shown to display variation in plumage coloration related to age and breeding status (Harrison, 1996), changing from brownish to greyish and white color during breeding season. Adults have mainly gray and brown plumage with a brownish bill, gray throat pouch and black facial skin and legs (Shields, 2002; Peterson, 2008; Tanglely, 2009).

Other reports of abnormal coloration in the Pelicaniformes order have been reported in the Peruvian pelican (*P. thagus*) in Peru (Torres & Franke, 2008), brown pelican in the United States (Nesbitt, 1979), brown booby (*Sula leucogaster*) in Brazil (Coelho & Alves, 1991), and species of Anhingidae and Phalacrocoracidae families in the United States (Post, 2012), but there are no records of abnormal coloration in the brown pelican in Costa Rica.

Here we present the first record of leucism in the brown pelican (*P. occidentalis*) in Costa Rica and notes about the behavior observed in the individual reported.

## **MATERIALS AND METHODS**

### **Observation Site**

Observations were made in the areas surrounding the piers contiguous to the estuary of Barrio del Carmen in Puntarenas city, Costa Rica (Fig. 1).

### **Methods**

The leucistic brown pelican was observed for four months on a casual basis by the authors and on a regular basis by Jorge Zúñiga-López, who collaborated with data regarding the pelican's permanence and behavior. Photographs of the subject were sent to the Natural History Department (*Departamento de Historia Natural*) at Museo Nacional de Costa Rica to be included in their photographic catalog (registry codes: Z8216, Z8217 and Z8216).

### **Observation**

On November 10, 2013, while observing a group of browns pelicans

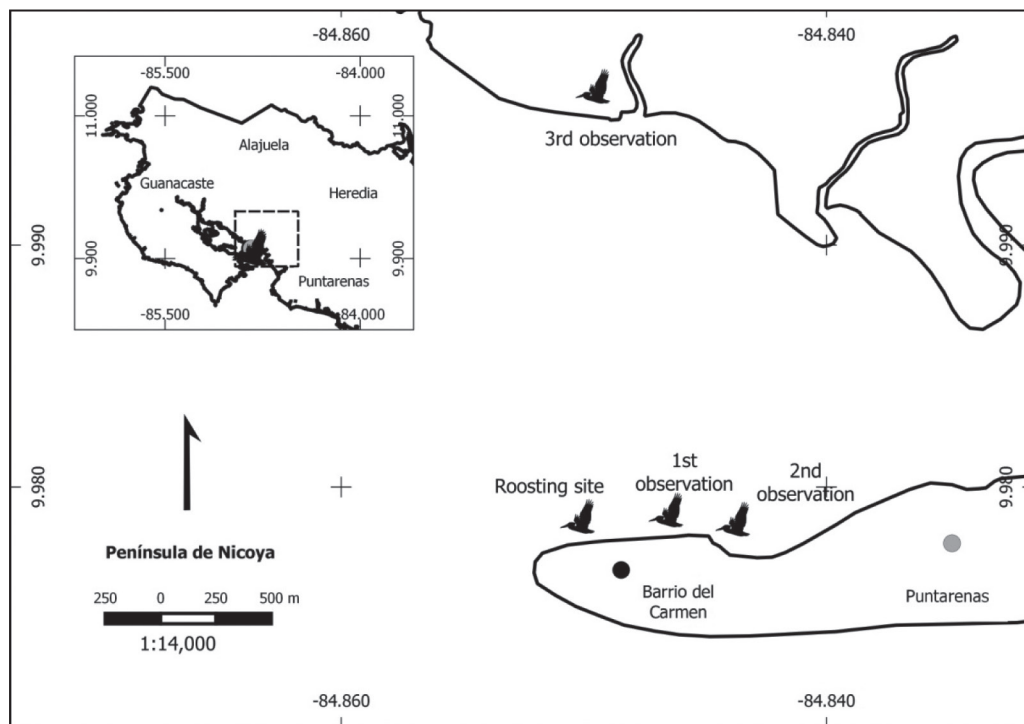


Fig. 1. Observation sites of the leucism case in a brown pelican (*Pelecanus occidentalis*) in Puntarenas, Costa Rica

Fig. 1. Sitios de observación del caso de leucismo en el pelicano pardo (*Pelecanus occidentalis*) en Puntarenas, Costa Rica

feeding on fish scraps from fishermen, one individual was identified by the researchers that showed white color on all plumage and body parts (Fig. 2). The behavior of this pelican differed from the others since the rest tried to prevent the individual from getting fish, which could be related to social rejection from the other pelicans due to its different color.

There were no dark pigments in any body feathers. The bill was completely pink including the throat pouch and legs, but normal pigmentation was detected on the eyes. During the initial observation, the bird had slightly

brown feathers in few parts of the body. However, the feathers on the neck, head and wings had a more tawny coloration during the last observation four months later (March 23, 2014).

Although the size and plumage of the observed subject resembled that of a juvenile brown pelican, the individual was considered to be an adult because of the whiteness of its iris (Fig. 2) given that adult *P. occidentalis* always have white coloration on their iris (Stiles & Skutch, 2007). In addition, it was concluded that the observed individual was not an albino brown pelican because the coloration of the



Fig. 2. Adult brown pelican (left) and leucism case in a brown pelican (*Pelecanus occidentalis*) (right) in Puntarenas, Costa Rica (Photos: Roberto Vargas & Jorge Zúñiga)

Fig. 2. Adulto de pelicano pardo (izquierda) y caso de leucismo en el pelicano pardo (*Pelecanus occidentalis*) (derecha) en Puntarenas, Costa Rica (Fotografías: Roberto Vargas y Jorge Zúñiga)

eyes of albino subjects is usually red (Edelaar *et al.* 2011).

The subject remained in the same area during the first three months, returning every sunset to a roosting site in a *Ceiba pentandra* tree (Fig. 1). After February 2, 2014, the bird was not observed in that area, as reported by high school teacher and birdwatcher Jorge Zúñiga-López. A month later (March 18, 2014), a fisherman of the area (Eduardo Oviedo-Cortez) reported

that the individual had been observed for several days in the mangrove located 3 km in front of the roosting site. On March 30, 2014, the pelican returned to the initial roosting area.

## DISCUSSION

Similar to other reports on leucism observed for the Peruvian pelican (*P. thagus*), local fishermen favored the individual and provided food, likely increasing the survival of these

individuals (Torres & Franke, 2008). The occurrence of slightly brown feathers can be a sign of reduced pigmentation or an incidence of mild leucism (Torres & Franke, 2008). The individual described in this paper showed white coloration, mainly in wing and head feathers, which was intensified during the last observation. It is assumed that changes on plumage were due to the breeding season.

Nesbitt (1979) reported a case of albinism in a brown pelican in Florida, whose entire body was white with few tawny feathers on its wings and back, but had normal coloration on its feet and bill. There are unpublished pictures of another leucistic brown pelican in Florida presenting normal coloration on its bill and feet (Danny Bales, <http://www.flickr.com/photos/mudhen>).

Leucism in birds is the most frequently reported color aberration, resulting in low survival rates for these individuals (Cook *et al.* 2012). Reports of abnormal colorations in birds and other animals are important to increase our knowledge of their frequency in different populations and species.

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## BIBLIOGRAPHY

- Coelho, E. P. & Alves, V. S. (1991). Um caso de albinismo em *Sula leucogaster* na ilha de Cabo Frio, Rio de Janeiro (Pelecaniformes: Sulidae). *Ararajuba*, 2, 85-86.
- Cook, T. E., Jewell, O. J. D., Chivell, W. & Bester, M. N. (2012). An albino cape cormorant *Phalacrocorax capensis*. *Mar. Ornithol.*, 40, 72-73.
- Davis, J. N. (2007). Color abnormalities in birds: A proposed nomenclature for birders. *Birding*, 39, 36-46.
- Edelaar, P., Donazar, J., Soriano, M., Santillán, M. A., González-Zevallos, D., García-Borboroglu, P., Lisnizer, N., Gatto, A. J., Agüero, M. L., Passera, C. A., Ebert, L. A., Bertellotti, M., Blanco, G., Abril, M., Escudero, G. & Quintana, F. (2011). Apparent selective advantage of leucism in a coastal population of Southern caracaras (Falconidae). *Evol. Ecol. Res.*, 13, 187-196.
- Gross, A. O. (1965). The Incidence of Albinism in North American Birds. *Bird Banding*, 36(2), 67-71. doi: <http://dx.doi.org/10.2307/4511145>
- Harrison, P. (1996). *Seabirds of the World: A Photographic Guide*. New Jersey, USA.: Princeton Univ. Press.
- Nesbitt, S. A. (1979). An albinistic brown pelican. Florida. *Field Naturalist*, 7(1), 6.
- Peterson, R. T. (2008). *Peterson field guide to birds of North America*. Boston, USA.: Houghton Mifflin Co.
- Post, W. (2012). First report of abnormal plumage in the Anhingidae. *Fla. Field Nat.*, 40(3), 81-84.
- Rodríguez-Pinilla, Q. & Gómez-Martínez, M. J. (2011). Leucismo incompleto en *Turdus fuscat* (Passeriformes: Turdidae) en los andes colombianos. *Bol. Cient. Mus. Hist. Nat.*, 15(1), 63-67.
- Shields, M. (2002). Brown Pelican (*Pelecanus occidentalis*): The Birds of



- North America Online, Ithaca, New York. Retrieved on March 18, 2014, available in [http://www.allaboutbirds.org/guide/brown\\_pelican/lifehistory](http://www.allaboutbirds.org/guide/brown_pelican/lifehistory)
- Sibley, D. (2011). Abnormal coloration in birds: Melanin reduction. Sibley Guides: Identification of North American birds and trees. Retrieved on March 18, 2014, available in <http://www.sibleyguides.com/2011/08/abnormal-coloration-in-birds-melanin-reduction/>
- Stiles, F. G. & Skutch, A. F. (2007). *Guía de aves de Costa Rica*. Heredia, Costa Rica: INBio, Instituto Nacional de Diversidad.
- Tangley, L. (2009). Oil Spill Hammers Brown Pelicans. *Natl. Wildlife*, 48(6), 12-14.
- Torres, M. & Franke, I. (2008). Report of albinism in *Podiceps major*, *Pelecanus thagus* y *Cinclodes fuscus* and a revision of wild albino birds from Peru. *Rev. Peru. Biol.*, 15(2), 105-108.
- van Grouw, H. (2006). Not every white bird is an albino: sense and nonsense about colour aberrations in birds. *Dutch Birding*, 28, 79-89.
- Yusti-Muñoz, A. P. & Velandia-Perilla, J. H. (2013). Un caso de leucismo en *Columbina talpacoti* (Columbidae) en el Valle del Cauca, Colombia. *Ornitolo. Colombiana*, 13, 80-82.