

## A NEW CASE OF ALBINISM IN THE BAT *MICRONYCTERIS MINUTA* (CHIROPTERA: PHYLLOSTOMIDAE) FROM COSTA RICA

Melquisedec Gamba-Ríos

Association for the Conservation of Bats of Costa Rica, 2314-2050 San Pedro, Costa Rica

*Key words:* albinism, bats, Costa Rica, melanin, Phyllostomidae.

### INTRODUCTION

Albinism is an anomaly characterized by a complete lack of color (melanin), and in its complete manifestation the skin is clear, the fur is white, and the eyes are red (Herreid & Davis 1960, Buchanan 1985). This anomaly is very rare in bats, although there are a few species that are completely white without being albinos, (e.g.) *Ectophylla alba* (H. Allen, 1892) and *Diclidurus albus* (Wied, 1820). Some bats also present albino-like characteristics such as white fur, but have pigmented eyes. In yet other cases there are individuals with partially white-colored fur, e.g. in *Carollia sowelli* (two specimens in the collection of the National Museum of Costa Rica; MNCR1025 and MNCR962, white spots on 15% to 20% of the fur). The few cases of complete albinism that have been reported (28 individuals in the New World and 36 in the Old) are found in the families Pteropodidae, Rhinopomatidae, Nycteridae, Rhinolophidae, Mormoopidae, Phyllostomidae, Vespertilionidae, and Molossidae (Uieda 2000). Within the New World leaf-nosed bats (Phyllostomidae), complete albinism has been documented in seven species, namely *Macrotus waterhousii* (Gray, 1843), *Glossophaga longirostris* (Miller, 1898), *G. soricina* (Pallas, 1766), *Carollia brevicauda* (Schinz, 1821), *Artibeus lituratus* (Olfers, 1818), *A. planirostris* (Spix, 1823), and *Desmodus rotundus* (Geoffroy, 1810) (Soriano *et al.* 1993, Uieda 2000).

I report here for the first time a case of complete albinism in *Micronycteris minuta* (Gervais, 1856).

This bat (Phyllostomidae: Phyllostominae) occurs from Nicaragua to South America, primarily in evergreen and deciduous tropical forests (Genoways & Williams 1979, Koopman 1993). Its diet is composed mainly of insects but there is evidence that it occasionally consumes fruit. The species is considered to be insecti-carnivorous as well as an insectivore foliage-gleaner (Goodwin & Greenhall 1961, Gardner 1977, LaVal & Fitch 1977, Patterson *et al.* 1996). It has been found roosting alone or in small groups in hollow trees (Fenton & Kunz 1977).

### METHODS

Study site was at the Centro de Conservación Santa Ana, which encompasses an area of 51 hectares, with a mean annual precipitation of 2000 to 2500 mm. It is composed of scrubland and secondary dry forest and is seen as a relict of premontane dry forest in the Central Valley of Costa Rica. The study area is located next to the Uruca River, and still offers suitable habitat for many bat species in this area (Holdridge 1947, Vargas *et al.* 2001).

I captured the bats using four mist nets (Fa. Avinet, 2.5 m high x 12 m long). Length of the forearm was measured with a caliper (0.1mm. Swiss Precision Instruments, INC<sup>TM</sup>) and body mass with a balance (Pesola<sup>®</sup>, max. 30 g, ± 0.3%). After recording these data, I released most bats in the area where they were captured.

### RESULTS AND DISCUSSION

On February 14<sup>th</sup>, 2004, I caught in the Centro de Conservación Santa Ana (9°56'N, 84°12'W, 856 meters above sea level), province of San José, Costa

\* e-mail: melquigamba@hotmail.com



FIG.1. Specimen of *Micronycteris minuta*, deposited in the Museo Nacional de Costa Rica (MNCR 1550). Note white fur and clear ears and wing membranes (Photo by Luis Viquez).

Rica, five individuals of *M. minuta*, which were identified based on Timm *et al.* (1999). One of them was a completely albinotic female, identified as an adult based on the absence of cartilaginous epiphyseal plates in the metacarpals and phalanges (Anthony 1988). This individual had white fur, clear skin (including the wing membranes), and red eyes. Its measurements were: head and body length 50 mm, tail 10 mm, hind foot 7 mm, ear 17 mm, tragus 7 mm, forearm 33 mm, and weight 5 g. It did not show any sign of lactation or pregnancy. The other individuals (three adult females and one adult male) exhibited the typical color patterns of this species, brown on the dorsum, and lighter, almost white, on the venter, as described in López-González (1998). The bat was collected and deposited in the National Museum of Costa Rica, catalog number MNCR 1550. There were no obvious differences in size between the albinotic bat and the other individuals; all had similar measurements within the range of the species.

This record of albinism is the first for Costa Rica, and provides additional evidence in understanding why this anomaly occurs. Individuals that are completely white are thought to be at a selective disadvantage, since predators are more likely to locate them (Feldhamer *et al.* 1999). However, the occurrence of white pelage in the absence of albinism in other bats suggests that perhaps this genetic mutation is not necessarily selected against in all species. Additional records of this phenomenon are thus important in investigating if, and why, albinism is common in some mammalian species, and whether it plays any role in natural selection and speciation.

#### ACKNOWLEDGMENTS

I would like to thank G. Chaverri, E. Kalko, B. Rodriguez-Herrera, and J. Arroyo-Cabrales for their help and comments on earlier versions of the manuscript, and Javier Guevara of MINAET for issuing the research permits.

## REFERENCES

- Anthony, E.L.P. 1988. Age determination in bats. Pp. 47–58 in Kunz, T.H. (ed.). *Ecological and Behavioral Methods for the Study of Bats*. Smithsonian Institution Press, Washington, D.C.
- Buchanan, G.D. 1985. Comments on frequency of melanism in *Myotis lucifugus*. *Journal of Mammalogy* 66: 178.
- Feldhamer, G.A., Drickamer, L.C.S., Vessey, H., & J.F. Merritt. 1999. *Mammalogy: Adaptation, Diversity, and Ecology*. McGraw-Hill, Boston.
- Fenton, M.B., & T.H. Kunz. 1977. Movements and behavior. Pp. 351–364 in Baker, R., Jones Jr., J.K., & D.C. Carter (eds.). *Biology of bats of the New World, family Phyllostomidae, part II. Special publications, The Museum, Texas Tech University* 13: 1–364.
- Gardner, A.L. 1977. Feeding habitats. Pp. 293–350 in Baker, R., Jones Jr., J.K., & D.C. Carter (eds.). *Biology of bats of the New World, family Phyllostomidae, part II. Special publications, The Museum, Texas Tech University* 13: 1–364.
- Genoways, H.H., & S.L. Williams. 1979. Records of bats (Mammalia: Chiroptera) from Suriname. *Annals of the Carnegie Museum* 48: 323–335.
- Goodwin, G.C., & A.M. Greenhall. 1961. A review of the bats of Trinidad and Tobago. *Bull. of Am. Mus. of Nat. History* 122: 189–301.
- Herreid, C.F., & R.B. Davis. 1960. Frequency and placement of white fur on free-tailed bats. *Journal of Mammalogy* 41: 117–119.
- Holdridge, L.R. 1947. Determination of world plant formations from simple climate data. *Science* 105: 367–368.
- Koopman, K.F. 1993. Order Chiroptera. Pp. 137–242 in Wilson, D.E., & D.M. Reeder (eds.). *Mammal species of the world: a taxonomic and geographic reference*. Smithsonian Institution Press, Washington, D.C.
- LaVal, R.K., & H.S. Fitch. 1977. Structure, movements and reproduction in three Costa Rican bat communities. *Occasional Papers, Museum of Natural History of the University of Kansas, Lawrence, Kansas* 69: 1–28.
- López-González, C. 1998. *Micronycteris minuta*. *Mammalian Species* 583: 1–4.
- Patterson, B.D., Pacheco, V., & S. Solari. 1996. Distributions of bats along an elevational gradient in the Andes of south-eastern Peru. *J Zool* 240: 637–658.
- Soriano, P.J., Utrera, A., & M. Sosa. 1993. Dos registros de murciélagos albinos para Venezuela. *Biollania* 9: 149–150.
- Timm, R.M., LaVal, R., & B. Rodríguez-H. 1999. Clave de campo para los murciélagos de Costa Rica. *Brenesia* 52: 1–32.
- Uieda, W. 2000. A review of complete albinism in bats with five new cases from Brazil. *Acta Chiropterologica* 2: 97–105.
- Vargas, G., Celis, G., & D. Vieira. 2001. Guía de árboles y arbustos del Centro de Conservación Santa Ana. San José, Costa Rica.

*Accepted 3 December 2009.*