

First record of a leucistic piebald *Phyllostomus discolor* (Chiroptera: Phyllostomidae)

Julia Tabea Treitler^{1,2,*}, Adrià López Baucells^{2,3,4}, Solange Gomes Farias^{2,5}, José Francisco Tenaçol Jr.², Ricardo Rocha^{2,3,6}

¹Institute of Experimental Ecology, University Ulm, Albert-Einstein-Allee 11, 89069 Ulm, Germany.

²Biological Dynamics of Forest Fragments Project, National Institute for Amazonian Research (INPA) and Smithsonian Tropical Research Institute, C.P. 478, Manaus, AM 69011-970, Brazil.

³Centro de Biologia Ambiental, Departamento de Biologia Animal, Faculdade de Ciências da Universidade de Lisboa, Bloco C2, Campo Grande, 1749-016 Lisboa, Portugal.

⁴Museu de Ciències Naturals de Granollers, Àrea Investigació en Quiròpters, Av. Francesc Macià 51, 08402 Granollers, Catalonia.

⁵Fundação Amazônica de Defesa da Biosfera (FDB), CEP 69083-230 Manaus, AM, Brazil.

⁶Metapopulation Research Group, Faculty of Biosciences, University of Helsinki, PO Box 65 (Viikinkaari 1), FI-00014 Helsinki, Finland.

* Corresponding author: juliatreitler@gmail.com

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Abstract

Aberrant colorations resulting from colour pigment deficiencies are commonly described in the bat literature. In this study we report the first leucistic piebald of *Phyllostomus discolor* (Wagner, 1843) by describing an individual captured in Central Amazonia, Brazil, that presented a distinct white patch on its body but normally pigmented eyes. This is the first report of hypo-pigmentation in the species, but also in the genus.

Keywords: Albinism, leucism, piebald, Brazil, Central Amazonia

Introduction

Atypical colorations occur with low frequency; nevertheless, they have been reported for several vertebrate taxa (e.g. amphibians (Mitchell & Church 2002; Teixeira et al. 1999), reptiles (Krecsák 2008; Rocha & Rebelo 2010), birds (Jehl 1985; Bried et al. 2005) and mammals (Uieda 2000; Acevedo & Aguayo 2008; Marin-Vasquez et al. 2010)).

In bats, colour pigment deficiencies have been reported for a wide array of species. Resulting aberrant colorations can be described as albinism (Uieda 2000; Sodr  et al. 2004; Garc a-Morales et al. 2010), a type of hypo-pigmentation that results from a hereditary lack of pigmentation based on a deficiency in one of the enzymes involved in the melanin synthesis and hereby the entire body is affected (the animal completely lacks pigmentation in all parts of the body, including the eyes which show reddish coloration because of the blood in the capillary vessels). A further type of hypo-pigmentation is leucism (Roncancio & Ram rez-Chaves 2008; Marin-Vasquez et al. 2010; Idoeta et al. 2011, Garc a-Morales et al. 2012), a integument pigmentation deficiency in which the

affected individual still preserves normally pigmented eyes and a partial whitish coloration pattern. The latter condition, often incorrectly reported as “partial albinism”, is usually caused by developmental anomalies in the differentiation of the pigment cells and is not necessarily related to genetic mutations. It can affect the whole body or it can be restricted to certain body regions, generating a hypo-pigmented phenotype known as “piebald”. This phenotype is characterized by the absence of pigment in irregular patches on an animal that apart from that exhibits normal coloration (Acevedo et al. 2009).

Cases of the above mentioned colour anomalies have been reported for a variety of neotropical bats (e.g. albinism has been reported for *Eumops glaucinus* (Sodr  et al. 2004) and *Glossophaga soricina* (Garc a-Morales et al. 2010), leucism for *Artibeus jamaicensis* (Marin-Vasquez et al. 2010) and piebald leucism for *Sturnira erythromos* (Roncancio & Ram rez-Chaves 2008) and *Lophostoma silvicolum* (Marin-Vasquez et al. 2010)), however, a literature review revealed that so far hypo-pigmentation, either partial or complete, regardless of its underlying causes, has not been recorded for *Phyllostomus*



Figure 1. Individual of *Phyllostomus discolor* presenting the white patch stretched from head to shoulder and upper arm.



Figure 2. Profile picture of the leucistic piebald bat showing its normal pigmented eyes.

spp.. The present publication reports the first case of a hypo-pigmentism in the genus by describing a leucistic piebald *Phyllostomus discolor* captured in continuous lowland primary forest in the Central Amazon, Brazil.

Material and Methods

Bat sampling was conducted from August 2011 to August 2012 in the study area of the Biological Dynamics of Forest Fragmentation Project (BDFFP). This survey was part of a project that aims to determine the effects of forest fragmentation on bat assemblages within the study area, located 80 km north of Manaus, Amazonas state, Brazil (2°25'S, 59°50'W) and at an altitude of 30-125 m a.s.l.. The annual rainfall in this area varies between 1900 and 3500 mm per year, with a rainy season between October and May (Laurance et al. 2011). The predominant habitat in this region of the Amazon Basin is unflooded lowland with primary continuous forest (terra-firme).

Fieldwork was carried out in six localities, 3 located in continuous rainforest (KM 41, Cabo Frio and Florestal) and 3 located in abandoned cattle ranges that contain forest fragments ranging from 1 to 100 ha (Dimona, Porto Alegre and Colosso). In total, 17 sampling sites are scattered around the 6 localities and each was sampled 4 times using fourteen 12 × 2.5 m understory nets and three 2.5 × 12 m canopy mist nets. The mist nets were opened at 6:00 p.m. and closed at 12:00 a.m. adding to a total capture effort of nearly 7000 net hours across the whole study area (1 net hour corresponds to one 12 x 2.5 m mist-net opened for 1 h).

Results and Discussion

During the survey we captured 1622 individuals belonging to 54 species. In total we captured 24 *Phyllostomus discolor*. Normally, *P. discolor* has short, dense and soft fur. The colour varies from different tones of brown to greyish through whitish tips, which give a light grey or

frosted appearance (Kwiecinski 2006). Nevertheless, there is also huge colour variation among individuals from brownish to reddish dorsal fur. Of all *P. discolor* captured, one individual was captured on 15th April 2012 that presented atypical leucistic coloration.

This particular individual had a distinctive white patch, which extended from the head and face to the right shoulder and upper arm (Fig. 1 and Fig. 2). The patch was 45 mm in length and 24 mm in width. However, the rest of the body, eyes and wings showed normal coloration. This suggests this *P. discolor* individual as a case of leucistic piebald. It was an adult female with a weight of 36.0 g and presented the following morphometric measurements (in millimetres): forearm 62.8; tibia 23.8; foot 14.0; calcar 10.9; tail 10.3; ear 24.0; tragus 8.0. As the captured piebald bat was pregnant, which was determined by gentle palpation of the abdomen, it was not collected as a voucher specimen and was released at the same place it was captured after being marked with a ball-chain necklace (ring number A1249).

There are several reports of atypical coloration in bats especially in the Vespertilionidae family. In contrast, the family Phyllostomidae shows a rather low number of reported cases of aberrant coloration, mostly records of *Desmodus rotundus* (Uieda 2000; Sánchez-Hernández et al. 2010).

The possible effects of albinism and leucism on survival rates and fitness have been discussed in several papers related to hypo-pigmentation (e.g. Caro 2005). The leucistic *P. discolor* reported here did not present any indication of poor condition and given the pregnancy and normal weight, we suggest that it had no disadvantage during mating and reproducing phases. As mentioned in other publications (Rees 2004; Krecsák 2008; Sánchez-Hernández et al. 2010), our finding seems to support the hypothesis

that hypo-pigmentism might not be detrimental for bats.

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