

## AN ALBINO DEER IN THE JUNGLE: A MAGICAL CREATURE AND WHERE TO FIND THEM

Raquel Ribeiro<sup>1,2\*</sup> and Diogenes H. Siqueira-Silva<sup>3,4</sup>

<sup>1</sup>Museu de Biodiversidade Tauari, Faculdade de Biologia, Instituto de Saúde e Biológicas, Universidade Federal do Sul e Sudeste do Pará, Marabá, Brazil

<sup>2</sup>Programa de Pós-Graduação em Biodiversidade (PPGBEES), Universidade Federal do Oeste do Pará, Santarém, Brazil

<sup>3</sup>Research Group of Studies on the Reproduction of Amazon Fish (GERPA/LANEC), Faculdade de Biologia, Instituto de Saúde e Biológicas, Universidade Federal do Sul e Sudeste do Pará, Marabá, Brazil

<sup>4</sup>PPG in Biodiversity and Biotechnology (BIONORTE), PPG in Amazonian Animal Reproduction (ReproAmazon), Castanhal, Brazil

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Albinism is a condition in which an animal's skin, feathers, or fur is lighter in color than that of other animals of that species. We report a unique case of complete albinism in a red-brocket deer in the Brazilian Amazon rainforest. The individual, which we called a "magical creature," lives inside a conservation area in one of the most deforested regions of the Brazilian Amazon. The survival of the albino red-brocket deer in the wild might be related to the fact that it is so rare! Possibly, its main predators, pumas and jaguars, are only familiar with colored red-brocket deer, so they might not be interested in eating a white one. Our article shows how important it is to monitor species diversity and to conserve habitats that support species diversity in endangered regions such as the Brazilian Amazon.

## ALBINISM

A group of genetic conditions marked by little or none of the pigment melanin in the skin, hair, and/or eyes.

## PIGMENTATION

Coloring. The skin gets its color from a pigment called melanin.

## MELANIN

Special cells in the skin responsible for its color (more colored, dark skin, more melanin, less colored, white skin, less melanin).

### Figure 1

Albino animals have a genetic mutation that blocks the production of melanin, the pigment that gives color to skin, fur, feathers, and eyes. **(A)** Naja snake. **(B)** Wallaby. **(C)** Porcupine. (photo credits: **(A)** Vassil, CC0, via Wikimedia Commons. [https://commons.wikimedia.org/wiki/File:Naja\\_kaouthia\\_albino\\_Gen%C3%A8ve\\_24102014\\_2.jpg](https://commons.wikimedia.org/wiki/File:Naja_kaouthia_albino_Gen%C3%A8ve_24102014_2.jpg), **(B)** Apdency, CC0, via Wikimedia Commons. [https://commons.wikimedia.org/wiki/File:Albino\\_Bennett%27s\\_wallaby\\_with\\_joey\\_in\\_pouch.jpg](https://commons.wikimedia.org/wiki/File:Albino_Bennett%27s_wallaby_with_joey_in_pouch.jpg), and **(C)** j.r.s, CC0, via Wikimedia Commons. [https://commons.wikimedia.org/wiki/File:Hystrix\\_cristata\\_albino.jpg](https://commons.wikimedia.org/wiki/File:Hystrix_cristata_albino.jpg)).

## GENETIC MUTATION

A change in a specific gene that causes mutations leading to special conditions like albinism or, in extreme situations, severe health problems.

## WHAT IS ALBINISM?

Have you ever seen a completely white animal from a species that is not normally white, like a bear (not a polar bear), a bird, or a snake? That completely white animal is called an albino. **Albinism** is a condition that results in loss of **pigmentation** (natural coloring) in the eyes, scales, hair, feathers, or skin. Complete albinism is the *total* lack of pigmentation resulting in pale skin, white fur, and pink eyes [1]. People of color and colorful animals have lots of a pigment called **melanin**, and pale animals and people have less of it. Some animals and people carry a **genetic mutation** that affects the production of melanin, which therefore affects the color of their bodies, making them albinos. There are plenty of albino animals, including snakes, bats, tapirs, giraffes, and peacocks, to name a few (Figure 1). However, albino animals are difficult to see in the wild.

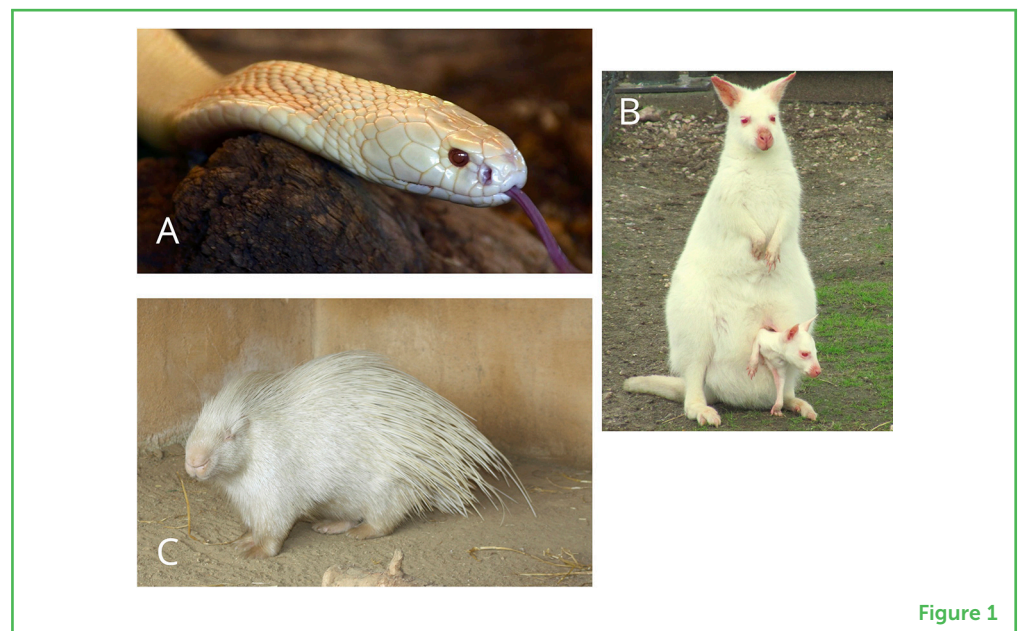


Figure 1

Some scientists think that albino animals can be easily spotted in the jungle, which would expose them to predators that hunt them [2, 3]. Albino animals also have bad eyesight, which may make it difficult for them to find food or avoid threats. Because of their pale skin, they are more vulnerable to sunburns and thus cannot search for food or mates in sunny places [4].

## THE ALBINO DEER IN THE AMAZON FOREST

Our research team was the first to spot an albino red-brocket deer in the heart of the Amazon forest. We were thrilled to find this rare creature and worried that it was in danger. Jaguars love eating red-brocket deer, however a shiny white one, like some of the Harry Potter's Patronus charm, might attract lots of attention. Our "magical"

albino deer is hidden in a conservation area located in the most deforested region of the Brazilian Amazon jungle (Figure 2). This conservation area protects a lot of animals like peccaries, anteaters, pumas, jaguars, and deers. We call this area the “special site.”

### Figure 2

(A) We call the place inside the Brazilian Amazon Forest where we hide the cameras to secretly image the animals who live there the “special site.” (B) Sensors of a camera trap set in the forest take a picture or video whenever a creature crosses in front of the camera.

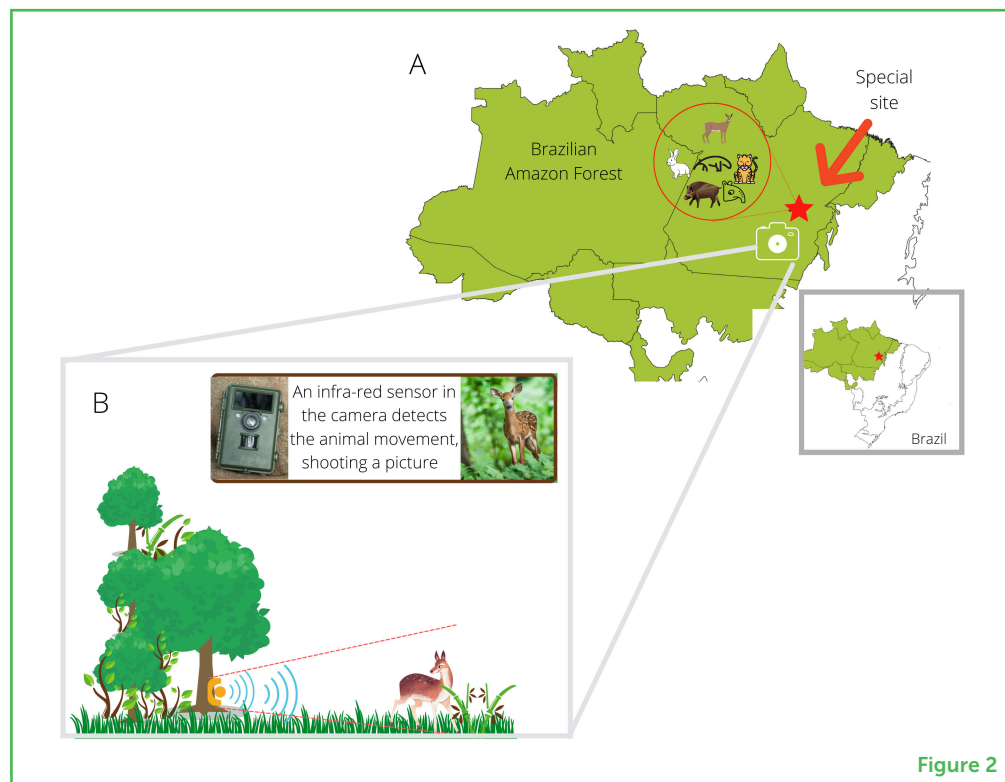


Figure 2

## HOW DID WE FIND AN ALBINO RED BROCKET DEER?

Searching for animals in dense forests can be a huge adventure. We needed to observe wild animals without bothering them so they could be themselves in the jungle. We wanted to find out which kinds of animals were present, what they eat, how they hide from predators, and how they hunt their prey. How did we do it? By secretly taking pictures of all the animals that passed in front of our hidden cameras called **camera traps**. A camera trap has infrared sensors that detect animals' presence and movements. Every time an animal crosses in front of the camera, the sensor activates the camera, which then takes a picture or records a video (Figure 2). To see the animals that visit that part of the forest, we hid camera traps on trees for 60 days during the dry season and again during the wet season. Ten camera traps were positioned along two long trails of 5 km each inside the Amazonia lowland forest. The cameras operate 24 h per day, 7 days per week for the entire photographing period. The red-brocket deer is a common species in the Amazon; During the photographing period, we got at least 80 photos of red-brocket deer, along with a lot of other mammals.

### CAMERA TRAP

Equipment with a camera inside that automatically takes pictures when its sensors detect the presence of an animal.

## THE ALBINO RED-BROCKET DEER: OUR MAGICAL CREATURE

Red-brocket deer are quiet and usually live alone, with their siblings, or with their partners during the reproductive season. Most of their body parts are reddish-brown, but their necks and faces are usually gray. The inner parts of their limbs and tails are white, along with the cheek area, the tip of the jaw, and the inner edge of the ears. Their hind legs are black on the backside and can vary from dark to lighter black on the front side (Figure 3A).

### Figure 3

Red-brocket deer photographed with our camera traps. **(A)** The normal-colored red-brocket deer has red fur, brown skin, black legs, and light brown ears and snout. **(B)** The albino “magical creature” has white fur, pale skin, ears, and snout, and red eyes.

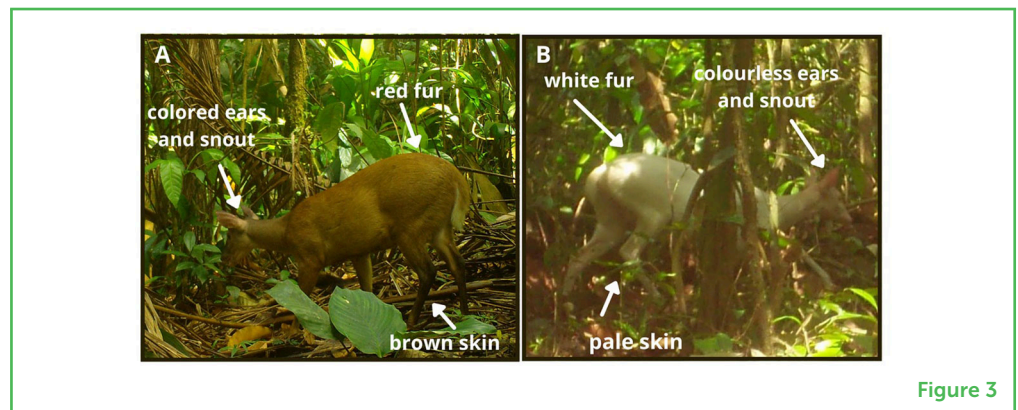


Figure 3

The albino deer that we spotted is a young male with a white body including its hind legs, front legs, and both sides of the tail (Figure 3B). His snout and the back of his ears are white, and he also has red eyes, which is a distinctive characteristic of albino animals. His movements and activity seem to be normal, and there are no signs of fights such as scars or injuries on his skin.

## ADVANTAGES AND DISADVANTAGES OF BEING AN ALBINO DEER IN THE AMAZON

Our finding was impressive because a total albino red-brocket deer had never been seen in Brazil before. Our first thought was that this magical, beautiful creature might be in danger. Maybe no albino deer were spotted before because they are so visible to predators that they cannot survive until adulthood, because predators might eat these unique animals as soon as they see them [5], or perhaps albino red-brocket deer are so rare that research surveys could never find them. We do not know exactly why albino red-brocket deer have never been found before.

However, since this deer survived until adulthood, maybe there is actually some advantage to being albino. Being different could be advantageous if the habitat contains a high number of prey animals. It is possible that the more different a prey animal is from others, the safer it is [6]. Maybe the main predators of red-brocket deer,

## DEFORESTATION

The process of clearing forests by cutting down trees.

## DIVERSITY

The number of different species living in a certain place.

pumas and jaguars, are only used to colored red-brocket deer, so they would not be interested in a white one. Think of it like children who love to eat watermelons. If they see a yellow watermelon (also a genetic mutation) on supermarket shelves, they will probably avoid it because of its unique color; they might not know that yellow watermelons exist. However, if the yellow watermelon is the *only* available food, they might try it, even if it looks odd. Similarly, being a white red-brocket deer in a site with normal-colored prey animals might be advantageous for the albino deer [7].

Conservation areas like our special site have many trees, small mammals, medium-sized herbivores, birds, and large predators. All these organisms keep the jungle working in balance. **Deforestation**, pollution, or the burning of forests cause animals to die or try to escape, disturbs the nature's precious balance. If this albino red-brocket deer lives in a small, deforested area with no food options available for its predators, then he is in a disadvantaged position and likely will be eaten as soon as a predator sees him.

## A SIGN OF HOPE

We conclude that currently, the dense vegetation in the environment of our special site in the Amazon Forest is helping the albino deer, protecting it from the harmful effects of sunlight, and supplying plenty of food options. Another explanation for its survival is the high population number of another species of deer in that habitat, the Amazonia brown-brocket deer. The large number of these deer decreases the likelihood of an encounter between predators and the albino deer. There are also lots of other animal species that serve as prey for the deer's predators. An abundance of prey gives an albino animal a chance to avoid being chosen by predators, which favors its survival. If other prey animals were not available, it would increase the risk of this wonderful creature being eaten by predators. The presence of an adult albino deer on our special site in the Amazon Forest could indicate that the presence of a wide variety of prey is an important factor for maintaining the high **diversity** of species, including those with rare genetic characteristics like albinism.

## ORIGINAL SOURCE ARTICLE

Ribeiro, R., and de Siqueira-Silva, D. H. 2020. First report of complete albinism in mazama Americana (Erxleben, 1777) in the biological reserve of tapirapé, oriental amazon, Brazil. *Acta Sci. Biol. Sci.* 42:1–7. doi: 10.4025/actascibiolsci.v42i1.46734

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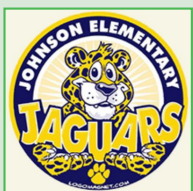
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## YOUNG REVIEWERS

### JOHNSON ELEMENTARY SCHOOL, AGES: 9–10

We are three fourth grade classes, excited about all things science. We live in Natick, Massachusetts and enjoyed being a part of the scientific review process. We learned



about how a research paper develops and that science is more than experiments. Science involves research, review, and reflection, too.



### **3RD/4TH KENSINGTON CUB SCOUTS, AGES: 8–11**

We are: 3rd/4th Kensington Group in Kingsford Smith District in South Met. Region in NSW State, Sydney, Australia. We have weekly meetings where we play action games, learn teamwork and practice social and life skills. We run special activities doing science, art, and everything in between. We also have special events like Day Out and Camps—lots of fun and learning for all girls and boys!

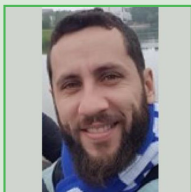
## **AUTHORS**

### **RAQUEL RIBEIRO**



Dr. Raquel Ribeiro is a biologist with a Ph.D. in Ecology and postdoctoral studies in Zoology. Dr. Ribeiro conducts research on the ecology of mammals in various Brazilian biomes (Cerrado, Amazonia, and Caatinga). She is currently a professor at the Federal University of South and Southeast of Para, Marabá, Pará, Brazil, and her recent research is about the impact of climate change on mammals of the southeast Amazon and in this region's ecological services. \*[raquelribeiro@unifesspa.edu.br](mailto:raquelribeiro@unifesspa.edu.br)

### **DIOGENES H. SIQUEIRA-SILVA**



Dr. Diogenes H. Siqueira-Silva is a biologist with a Ph.D. in Animal Biology and postdoctoral studies in Biotechnology of Fish Reproduction. Dr. Siqueira-Silva performs research on cell biology and physiology using fish. He is currently a professor at the Federal University of South and Southeast of Para, Marabá, Pará, Brazil, and his recent studies are focused on the impact of both climate- and human-caused changes in fish reproduction.