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A leucistic female *Canis latrans* (Carnivora: Canidae) in Costa Rica

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ABSTRACT:

Partial depigmentation (leucism) is rare in mammals. We report 17 camera trap records of a single female leucistic coyote (*Canis latrans*) in Costa Rica between 2014 and 2018.

KEYWORDS: Coyote, mammal, leucism, camera trap, Costa Rica.

RESUMEN:

AUTHOR NOTES

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“Hembra de *Canis latrans* (Carnivora: Canidae) in Costa Rica”. La despigmentación parcial (leucismo) es poco común en mamíferos. Aquí reportamos un total de 17 registros fotográficos de una hembra leucística de coyote (*Canis latrans*) en Costa Rica entre 2014 y 2018.

PALABRAS CLAVE: Coyote, mamífero, leucismo, cámara trampa, Costa Rica.

The coyote (*Canislatrans*) is a canid with a geographic distribution ranging from Alaska to western Panama (Wainwright, 2007). In Costa Rica, it is associated with both open (e.g. dry forest, paramo), and disturbed habitats (e.g. agricultural lands, areas near small towns) and primarily at elevations below 3 400m (Wainwright, 2007; Wilson & Mittermeier, 2009). Coyote coloration ranges from gray to rufous, with darker and grayer colorations more common at higher latitudes (Bekoff, 1977; Wilson & Mittermeier, 2009). Melanistic coyotes are rare (Gipson, 1976; Wilson & Mittermeier, 2009) while albino and leucistic (e.g. partially depigmented) coyote reports are even scarcer (Johnston, 1930; Young, 1951; López-González, 2011). Herein, we document the first evidence of a leucistic coyote in Costa Rica.

The study area encompasses the western boundary of *Cordillera Volcánica Central* Forest Reserve and Barbilla-Destierro Biological Subcorridor (Fig. 1). This area is characterized by a wide altitudinal gradient, with elevations ranging from 75m up to 3 340m (Bolaños & Watson, 1993; Panthera, 2015). The main economic activities are livestock, agriculture and tourism (Panthera, 2015).

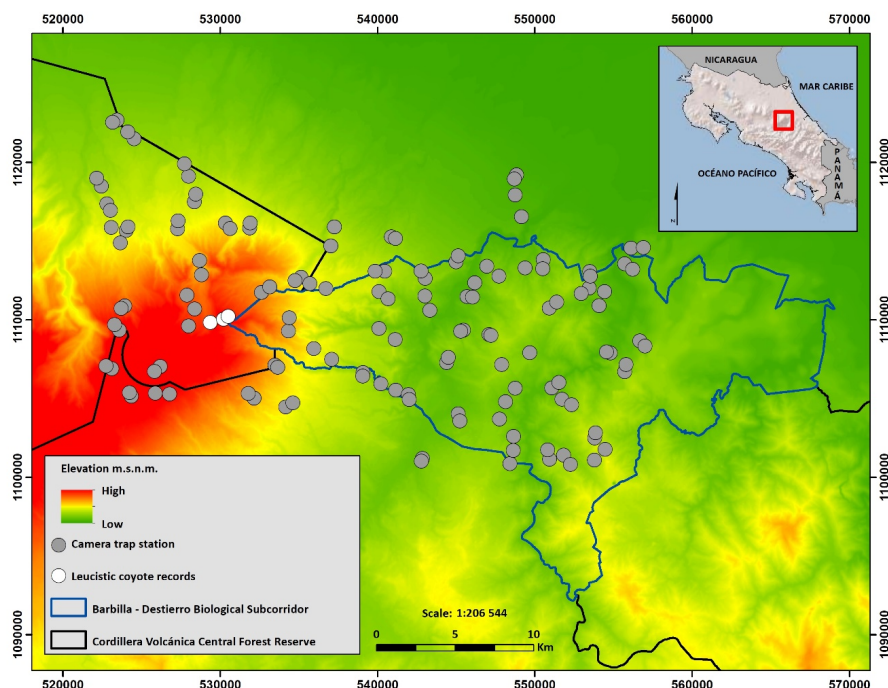


Fig. 1. Records of a leucistic coyote across the study area, Costa Rica.

As part of a mammal monitoring research project, from August 25, 2014 to April 23, 2015 a total of 52 camera traps (PANTHERA V3, V4, V5) stations were located across *Cordillera Volcánica Central* Forest Reserve (for a total of 3 495 camera trap nights). Additionally, a total of 90 camera trap stations were located in Barbilla-Destierro Biological Subcorridor from August 29, 2017 to August 02, 2018 (for a total of 9 041 camera trap nights) (Fig. 1). A total of 17 occurrences of a white coyote were recorded at three locations approximately 1km apart (Table 1). All these records correspond to what appears to be the same adult female, characterized by her white fur with a slight rufous coloration across her body (Fig. 2). The authors consider it to be a leucistic individual due to the partial depigmentation of the fur and normal coloration of the eyes,

which is consistent with Jehl (1985). Albino individuals, on the other hand, are completely white and their eyes are red or blue (Hu, Hanifin, Prescott, & Tongue, 1980)

TABLE 1
Occurrence events of a female leucistic coyote (*Canis latrans*) in Cordillera Volcánica Central Forest Reserve and Barbilla-Destierro Biological Subcorridor, Costa Rica

Camera trap	Date	Time	Coordinates (N & W)
Station 02	April 01, 2015	5:35	10,038825 & -83,724521
Station 03	March 30, 2015	22:55	10,037004 & -83,732208
Station 03	March 31, 2015	23:04	10,037004 & -83,732208
Station 01	September 06, 2017	16:55	10,040437 & -83,721807
Station 01	September 08, 2017	20:10	10,040437 & -83,721807
Station 01	September 17, 2017	21:40	10,040437 & -83,721807
Station 01	September 18, 2017	13:22	10,040437 & -83,721807
Station 01	September 24, 2017	3:25	10,040437 & -83,721807
Station 01	September 24, 2017	21:51	10,040437 & -83,721807
Station 01	September 24, 2017	22:09	10,040437 & -83,721807
Station 01	December 03, 2017	10:18	10,040437 & -83,721807
Station 01	December 11, 2017	22:48	10,040437 & -83,721807
Station 01	December 13, 2017	4:35	10,040437 & -83,721807
Station 01	January 02, 2018	15:53	10,040437 & -83,721807
Station 01	January 05, 2018	1:34	10,040437 & -83,721807
Station 01	January 06, 2018	2:44	10,040437 & -83,721807
Station 01	January 07, 2018	0:54	10,040437 & -83,721807



Fig. 2. Camera trap photos of coyotes (*Canis latrans*) recorded in the study area, Costa Rica. Above: a leucistic coyote; below: a coyote with standard coloration.

Abnormal colorations in wild populations of coyotes are extremely rare. For instance, in the United States, Johnston (1930) mentioned just one albino coyote out of 20 000 individuals, while Young (1951) reported that in 30 years, one out of 287 767 individuals were albino. More recently, López-González (2011) documented one leucistic coyote in the Chihuahuan Desert of Durango, México. It is still unclear what factors trigger this condition in the wild. However, some authors (Bensch, Hansson, Hasselquist, & Nielsen, 2000; Brito & Valdivieso-Bermeo, 2016) linked leucism to inbreeding (e.g. due to isolation of populations), heritable mutation (van Grouw, 2013) and environmental factors (e.g. nuclear pollution; Moller & Mousseau, 2001). Regardless of the cause, it could be assumed that the lack of pigmentation on coyotes, and on most other wild species, could represent an ecological disadvantage in the Tropics. For example, their inability to camouflage could decrease their hunting success and make them an easier target for sympatric predators (e.g. *Panthera onca*, *Puma concolor*). Furthermore, it could also reduce an individual's breeding success, as well as its communication and thermoregulation (Caro, 2005). In conclusion, it is important for researchers to document occurrences of unusual colorations in wildlife to gain a better understanding of this condition.

Ethical, conflict of interest and financial statements: The authors declare that they have fully complied with all pertinent ethical and legal requirements, both during the study and in the production of the

manuscript; that there are no conflicts of interest of any kind; that all financial sources are fully and clearly stated in the acknowledgements section; and that they fully agree with the final edited version of the article. A signed document has been filed in the journal archives.

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REFERENCES

- Bensch, S., Hansson, B., Hasselquist, D., & Nielsen, B. (2000). Partial albinism in a semi-isolated population of Great Reed Warblers. *Hereditas*, 133, 167-170. DOI: 10.1111/j.1601-5223.2000.t01-1-00167.x
- Bekoff, M. (1977). *Canis latrans*. *Mammalian Species*, 79, 1-9. DOI: 10.2307/3503817
- Bolaños, R., & Watson, V. (1993). *Mapa Ecológico de Costa Rica, según el sistema de clasificación de Zonas de Vida del Mundo de L. R. Holdridge (Escala: 1:200 000)*. San José, Costa Rica: Centro Científico Tropical.
- Brito, J., & Valdivieso-Bermeo, K. (2016). First records of leucism in eight species of small mammals (Mammalia: Rodentia). *Therya*, 7, 483-489. DOI: 10.12933/therya-16-408
- Caro, T. (2005). The adaptive significance of coloration in mammals. *Bioscience*, 55, 125-136. DOI: 10.1641/0006-3568(2005)055[0125:TASOCI]2.0.CO;2
- Gipson, P. (1976). Melanistic *Canis* in Arkansas. *The Southwestern Naturalist*, 21, 124. DOI: 10.2307/3670332
- Hu, F., Hanifin, J. M., Prescott, G. H., & Tongue, A. C. (1980). Yellow mutant albinism: Cytochemical ultrastructural and genetic characterization suggesting multiple allelism. *American Journal of Human Genetics*, 32, 387-395.
- Jehl, J. R. (1985). Leucism in eared grebes in western North America. *The Condor*, 87, 439-441. DOI: 10.2307/1367236
- Johnston, A. (1930). Color in the Animal Kingdom. *Bios*, 1, 28-38.
- López-González, C. A. (2011). Registro de un coyote (*Canis latrans*) blanco en el desierto chihuahuense de Durango, México. *Acta Zoológica Mexicana*, 27, 871-873. DOI: 10.21829/azm.2011.273791
- Moller, A. P., & Mousseau, T. A. (2001). Albinism and phenotype of barn swallows. *Evolution*, 55, 2097-2104. DOI: 10.1111/j.0014-3820.2001.tb01324.x
- Panthera. (2015). *Programa de monitoreo de mamíferos medianos y grandes en el Subcorredor Biológico Barbilla-Destierro/Paso del Jaguar* (Informe Final). San Pedro, San José: Panthera-Costa Rica.
- van Grouw, H. (2013). What colour is that bird? *British Birds*, 106, 17-29.
- Wainwright, M. (2007). *The mammals of Costa Rica: a natural history and field guide*. Ithaca, New York, and London, United Kingdom: Zona Tropical, Comstock Publishing Associates, Cornell University Press.
- Wilson, D. E., & Mittermeier, R. A. (2009). *Handbook of the Mammals of the World*. Vol. 1. Carnivores. Barcelona, Spain: Lynx Editions.
- Young, S. P. (1951). *The clever coyote: its history, life, habits economic status and control*. Nebraska, USA: University of Nebraska Press.