RevCient.VidNat, 1(2) enero-junio, 2024, 46 -52

Nota científica

ISSN L 2992-6424

Revista Científica Vida Natural
Universidad Autónoma de Chiriquí
revistas.unachi.ac.pa

White-nosed Coati (*Nasua narica*) a predator of the Yellow-headed Caecilian (*Oscaecilia ochrocephala*) in Panama

Coatí de nariz blanca (*Nasua narica*), un depredador de la cecilia de cabeza amarilla (*Oscaecilia ochrocephala*) en Panamá

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Enviado el 19 de agosto de 2023. Aceptado el 12 de octubre de 2023.

https://doi.org/10.59722/rcvn.v1i2.706

Abstract

We report a rare event of predation by the White-nosed Coati (*Nasua narica*) on the Yellow-headed Cecilia (*Oscaecilia ochrocephala*), during the wildlife monitoring, rescue and relocation process of the "Cerro Cucaracha" project within the Canal de Panama, through direct observation and photographic recording, this predator-prey relationship has been scarcely documented in Panama, with which we make a valuable contribution to the knowledge of this ecological interaction; considering that to expand this type of records it is necessary to increase the observation time in the field or implement sampling methodologies such as camera trap stations.

Keywords

Amphibian, behavior, diet, mammal, predation.

Resumen

Reportamos un raro evento de depredación de Coatí de nariz blanca (*Nasua narica*) sobre la Cecilia cabeza amarilla (*Oscaecilia ochrocephala*), durante el proceso de monitoreo, rescate y reubicación de vida silvestre del proyecto "Cerro Cucaracha" dentro de la cuenca del Canal de Panamá, a través de observación directa y registro fotográfico, esta relación depredador-presa ha sido escasamente documentada en Panamá, con lo cual hacemos un aporte valioso al conocimiento de esta interacción ecológica; considerando que para ampliar este tipo de registros es necesario aumentar el tiempo de observación en campo o implementando metodologías de muestreo como estaciones de cámaras trampa.

Palabras clave

Anfibio, comportamiento, depredación, dieta, mamífero.

ISSN L 2992-6424

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Introduction

The relationships between different species play a fundamental role in ecology, evolution, and natural history, therefore, it is essential to carry out precise documentation of these interactions to adequately understand the functioning of ecosystems, in particular, predator-prey dynamics that establishes a critical line for the transfer of nutrients and energy, thus contributing to the functionality and stability of said ecosystems (Bissattini et al. 2020; Zipkin et al. 2020; Eversole, 2022).

Background on the predator

Nasua narica (Linnaeus, 1766) the white-nosed coati is a medium-sized mammal belonging to the Procyonidae family (Torres-Valencia, 2023), has a social structure of adult females living in groups and solitary adult males (Gompper, 1997). Its distribution extends from the southern United States through Colombia, Ecuador, and Peru, west of the Andes (Aranda Sánchez, 2012; Salcedo-Rivera et al. 2022). White-nosed coatis are omnivorous, their diet consists mainly of fruits and invertebrates, but they also consume vertebrates, reptiles, and birds. (Kaufman, 1962; Valenzuela, 1998; Álvarez et al. 2013). They socialize in many areas where they coexist near human settlements, invading human garbage dumps (Marotta, 2017).

Background on the prey

The Gymnophiona order includes species with diverse habitats uses, types of reproduction, and morphological, physiological, and ethological aspects, they represent about 4 % of known living species of amphibians, they are mainly fossorian, they have about 150 described species distributed throughout Southeast Asia and American and African the tropics (Jared et al. 1999). In Panama, the order has eleven species that represent 4.7 % of the country's amphibians and two only families Caecilidae and Dermophidae, which include seven (3.04 %) and four (1.72 %) species respectively (Frost, 2023).

Oscaecilia ochrocephala (Taylor, 1968) are medium-sized caecilians (total length up to 617mm), the eyes are structurally reduced and covered by bone and skin, the tentacles are below and slightly in front of the nostrils, the coloration in life is light gray dorsally, the sides and belly greyish white, ring grooves dark grey, head pale yellow to pinkish, lighter on sides of the head. (Nieto-Román & Wake, 2012). It is distributed from central Panama to northern Colombia (Köhler, 2011; Fernández-Roldán et al., 2022). *O.*

ISSN L 2992-6424

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ochrocephala individuals have been found on the surface after dawn and dusk rain in Gamboa, Panama, and up to 10 meters underground in urban areas of Panama City (Köhler, 2011).

Despite extensive studies on the feeding of *N. narica*, through feces or direct observations, the predator-prey relationship with amphibians of the caecilians group has not been evident within the occasional vertebrate diet of the species. This manuscript seeks to contribute to knowledge about the diet of *N. narica* in the wild.

Materials and Methods

Study area

The observation was made in the Panama Canal basin in the eastern Pacific, close to Cerro Cucaracha and Culebra Cut, specifically at the coordinates 9° 2'52.29"N, 79°38'32.30"W, in a forest fragment secondary delimited on one side by an electrical transmission line and on the other by an internal road of the Panama Canal Authority (figure 1).

Figure 1.
Location of the predation event.

ISSN L 2992-6424

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Sampling and data collection

Within the work area during the workday from 8:00 a.m. to 4:00 p.m., wildlife rescue and relocation monitoring were carried out routinely using the generalized search methodology for direct observation of fauna, following a car circuit of approximately 6.5 km. The predation event was documented using a semi-professional Canon Powershot SX 540HS digital camera, obtaining eight 180dpi images in JPG format, with f/5.6, ISO-500, 76mm focal length and 4.97 aperture, and a 21-second video in MP4 format.

Results and Discussion

We report a predation event of the Yellow-headed Caecilian (*O. ochrocephala*) by an adult male of White-nosed Coati (*N. narica*) on October 25, 2022, at 13:40 h during a wildlife rescue and relocation monitoring tour after a heavy rain, while observing a group of white-nosed coatis in their routine foraging activities, we noticed an adult male individual eating what we initially thought was a snake, which caught our attention immediately. When we took the photographs, we realized that it was not a snake, but an adult Cecilia with a yellow head of approximately 45 cm (figure 2), once the photographs were taken, we recorded a video to demonstrate the behavior, through which we could notice while the White-nosed Coati chewed the Yellow-headed Caecilian that was still keeping its head, this helped us confirm the species.

Figure 2.
White-nosed Coati (*Nasua narica*) preying on a Yellow-headed Caecilian (*Oscaecilia ochrocephala*)

ISSN L 2992-6424

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The White-nosed Coati (*N. narica*) has a very varied diet that mainly includes some invertebrates, fruits, and occasionally some vertebrates (Gompper, 1996; Ferreira et al., 2013; Hirsch and Gompper, 2017), however, previous studies suggest that There are few records of vertebrate predation by Nasua narica (Gompper, 1996), coinciding with Russell (1982) who reported only rare predation of mice and lizards. Valenzuela (1998) for his part reports that 14.88% of the fecal samples obtained from his study population represent vertebrates, however, when breaking it down, he only mentions birds, mammals and reptiles, like the rest of the studies, do not consider within the diet amphibians, possibly due to the anatomy and physiology of these animals, when passing through the digestive tract of a White-nosed Coati they are completely digested without leaving tangible evidence in the feces (J. Ortega, personal communication, 21 de Agosto de 2023).

Smythe (1970a) postulated that solitary adult males are more likely to hunt vertebrates than females or group members and that vertebrate hunting is more common in the dry season when fruit availability is low, in our report the event of Predation, however, was by a solitary adult male that was close to a group and in the rainy season, after a heavy rain.

Due to the described and widely known feeding habits of *N. narica*, predation on individual caecilians could be more common than expected. However, this is only the second documented record of predation on the Yellow-headed Caecilian (*O. ochrocephala*), the first outside the island of Barro Colorado in Panama where John Kaufmann in 1962 in his doctoral thesis (Unpublished document) carried out the first report.

Acknowledgment

To Josue Ortega for providing valuable literature, for elaborated the map and comments for this document. To the Panama Canal Authority (ACP) and the company RETRANEQ, for authorizing us to use this data for this scientific contribution.

ISSN L 2992-6424

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