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CAT-EYED SNAKE, *LEPTODEIRA* SP. AFF. *ORNATA*, PREYING ON AN INTRODUCED GECKO IN COSTA RICA

SERPIENTE OJIGATA, *LEPTODEIRA* SP. AFF. *ORNATA*, DEPREDANDO A UN GECO INTRODUCIDO EN COSTA RICA

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Resumen.– Las serpientes ojigatas que pertenecen al género *Leptodeira*, se alimentan principalmente de anfibios, aunque también consumen otras presas. Sin embargo, no se han documentado lagartijas en la dieta de *Leptodeira* sp. aff. *ornata*. Esta serpiente, nativa de Costa Rica y Panamá, tiene relaciones taxonómicas y filogenéticas inciertas. Su dieta incluye principalmente anuros, tanto huevos como individuos adultos. Reportamos el primer caso documentado de depredación por parte de esta serpiente sobre el geco casero común, *Hemidactylus frenatus*. Este geco, originario de Asia, ha sido ampliamente introducido y es particularmente abundante en áreas urbanas y semiurbanas. La serpiente ojigata ingirió al geco comenzando por la cola, lo que contrasta con otro evento en el que una ojigata de bandas negras inició la ingestión de un geco de vientre amarillo desde la cabeza. Este hallazgo sugiere un posible comportamiento de forrajeo de esta serpiente ojigata en áreas semiurbanas y resalta el oportunismo en sus preferencias alimentarias.

Palabras clave.– Anfibios, depredación, dieta, geco casero común, lagartija.

Abstract.– Cat-eyed snakes from genus *Leptodeira*, primarily prey on amphibians, but also consume other prey types. However, lizards have not previously been documented as prey for *Leptodeira* sp. aff. *ornata*. This snake is native to Costa Rica and Panama, though its precise taxonomic and phylogenetic relationships remain unclear. Its diet primarily consists of anurans, including both eggs and adult individuals. We report the first documented case of predation by this Cat-eyed snake on the Common House gecko, *Hemidactylus frenatus*. This gecko, native to Asia, has been introduced to numerous regions worldwide and is particularly abundant in urban and semi-urban areas. The Cat-eyed snake ingested the Common House gecko starting from the tail, in contrast to a different event where a Black-banded Cat-eyed snake began ingesting a Yellow-bellied gecko from the head. This finding suggests potential foraging behavior of this Cat-eyed snake in semi-urban areas, highlighting another instance of opportunism in its dietary preferences.

Keywords.– Amphibians, Common House gecko, diet, lizards, predation.

Although there are many records of snake predation on lizards, observations of these events are difficult in the wild. Consequently, researchers often analyze fecal matter or stomach contents for dietary studies (Castro-Tafolla & Vásquez-Cruz, 2024). Detailed observations of predation events are rare due to the challenges of monitoring animals in their natural habitats (Santos-Silva et al., 2014). As a result, there is limited information on the specific prey of many tropical snakes. The low taxonomic definition in some species can be another complication in understanding their trophic ecology.

Leptodeira Fitzinger, 1843 is one of the most common snake genera with a wide distribution in the Neotropics (Barrio-Amorós, 2019; Torres-Carvajal et al., 2020; Antúnez-Fonseca et

al., 2023). Although 19 species are currently recognized within the genus (Uetz et al., 2023), some species formal recognition has been controversial (Daza et al., 2009; Barrio-Amorós, 2019; Costa et al., 2022). This complexity has led to confusion in the use of appropriate names for several populations (Duellman, 1958; Daza et al., 2009; Barrio-Amorós, 2019; Costa et al., 2022; Antúnez-Fonseca et al., 2023).

One confusing case is the Cat-eyed snake, *Leptodeira* sp. aff. *ornata*, a putative undescribed species from Costa Rica and northern Panama (Costa et al., 2022; Ali & Ali, 2024). Until recently, it was considered conspecific with the Northern Cat-eyed snake, *Leptodeira septentrionalis* (Kennicott, 1859) (Ali & Ali, 2024). *Leptodeira* sp. aff. *ornata* is a very common, pale brown snake with a slightly compressed body, a broad head with bulging eyes and vertically elliptical pupils, a pattern of dark dorsal blotches, and a light-colored venter (Savage, 2002). It is a small to moderate snake, reaching a total length of up to 100 cm in adult females and slightly less in males (Savage, 2002; Solórzano, 2022).

This Cat-eyed snake is commonly encountered in lowland moist and wet forests but is occasionally found in dry forests, premontane moist and wet forests, and rainforests, making it potentially one of the most abundant snakes in Costa Rica (Savage, 2002). Nocturnal and arboreal, it is often seen climbing the vegetation around marshes, ponds, or rivers with thriving amphibian populations (Savage, 2002).

Diet of *Leptodeira* sp. aff. *ornata* consists mainly of anurans, including both eggs and adult individuals. For example, it commonly preys on the eggs of hylid and phyllomedusid tree frogs (Duellman, 1958; Savage, 2002; Arias et al., 2015; Nuñez Escalante & Garro Acuña, 2020; Abarca et al., 2021; Dougherty & Lisondro, 2023; Griesbaum et al., 2023). Despite its slender body, this snake captures relatively large frogs with a quick strike, holding them in its mouth while injecting venom into the bite wounds. The frogs succumb rapidly and are swallowed once paralyzed (Solórzano, 2022). Two cases of ophiophagy have also been reported for this species (McKelvy et al., 2013; Nuñez Escalante et al., 2021).

Individuals of *L.* sp. aff. *ornata* have been observed feeding on squashed frogs and toads on roads, similar to other *Leptodeira* species (Mora, 1999; Oliveira et al., 2023; Gamez-Duarte et al., 2024). A novel feeding strategy was documented where a small individual captured and bit an adult Masked Tree Frog, *Smilisca phaeota* Cope, 1862, injecting venom into it for two hours until it was paralyzed, then consuming its internal organs (Arroyo-Trejos & Mora, 2016). Opisthoglyphous species like *Leptodeira* bite and hold their prey without releasing it, allowing their venom to take effect (Savage, 2002; Solórzano, 2022).

The Common House gecko, *Hemidactylus frenatus* Dumeril & Bibron, 1836, is a small lizard measuring about 67 mm SVL (López & Mora, 2021). It has a grayish-brown or dusky brown dorsum, sometimes with darker markings, and a uniformly cream or light beige venter (Das, 2010). Although it can naturally be found in forested areas, it predominantly inhabits human dwellings, often inside buildings where it feeds on insects (Neogi & Islam, 2017; Parmar & Tank, 2019).

On May 31, 2024, at 19:12 h, we casually observed a snake chasing, hunting, and consuming a house gecko inside an old refrigerator in an empty student dormitory at the Atenas campus of the Universidad Técnica Nacional (UTN) in Atenas County, Alajuela, Costa Rica (9° 56' 28" N, 84° 22' 34" W; 430 m a.s.l.; Fig. 1). The event was observed for about 20 min, and some pictures were taken from a close distance, without disturbing the snake, which continued its feeding behavior normally.

At that moment, the gecko's tail was on one side of the tray where both individuals were confronting each other. We left to get a smartphone and a camera, and when we returned, the gecko's tail was no longer there. At this point, the gecko tried to escape, but the snake captured it with a quick strike. The first bite was on the gecko's hindquarters (the gecko was missing most of its tail). The snake tried to adjust the gecko in its mouth but did not attempt to constrict it. The gecko shook vigorously but couldn't free itself from the snake's jaws and soon stopped moving.

Twenty-nine seconds into the attack, the snake adjusted its jaws to get a better grip on the gecko and began trying to swallow it. At sixty seconds, the snake stretched the front part of its body to realign itself with the gecko's body. The gecko was clearly alive but not moving. At 1.2 min, the snake had the gecko facing forward and began swallowing it from the back, where it had originally bitten it. At 1.35 min, the snake managed to get the gecko's legs through its throat (Fig. 2). The process continued gradually until the snake completely swallowed the gecko, taking a total of 6 min.

We report the first predatory interaction between *L.* sp. aff. *ornata* and a Common House gecko. Isolated instances of predation events remain noteworthy, as they contribute to a comprehensive understanding of snake ecology (Griesbaum et al., 2023). There is a strong interconnectedness between snakes

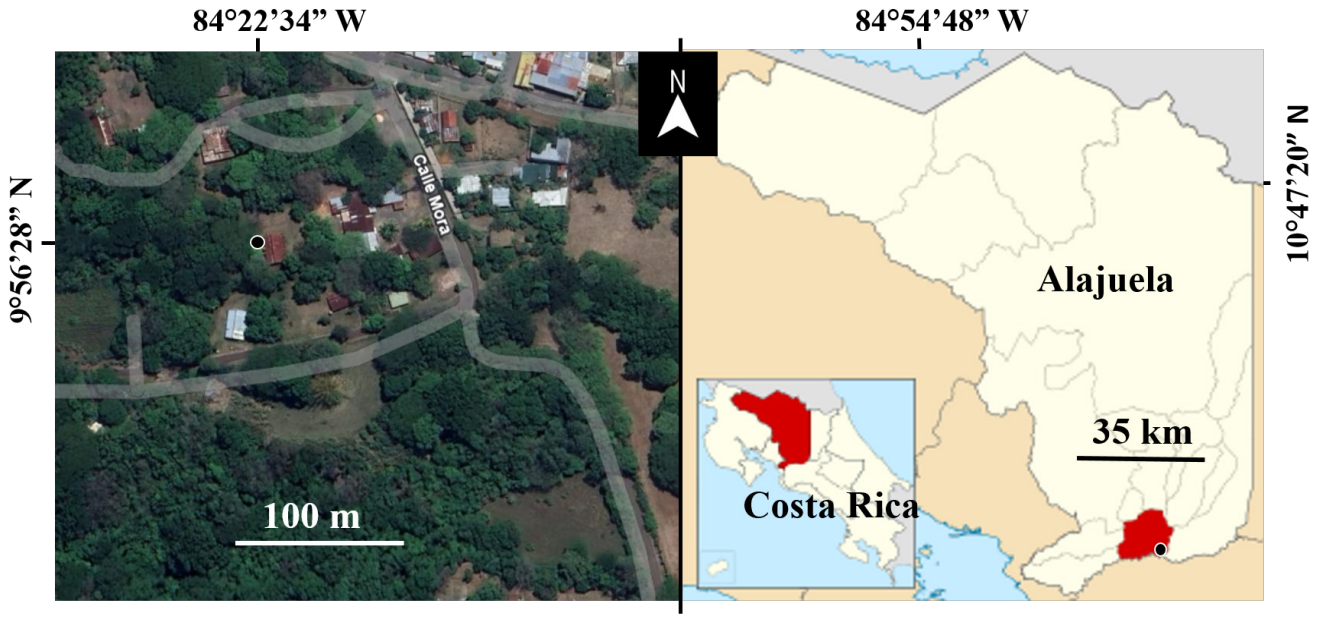

Figura 1. Sitio de observación (punto negro) en donde una serpiente ojigata *Leptodeira* sp. aff. *ornata*, depreda a un geco comú, *Hemidacntylus frenatus*, en el campus Atenas de la Universidad Técnica Nacional, Balsa, cantón de Atenas (resaltado en rojo) en la provincia de Alajuela (delineada en blanco pero mostrada en rojo en el mapa de Costa Rica). Figura basada en Google Earth (sección izquierda) y Wikipedia bajo licencia Creative Commons Attribution-ShareAlike 3.0 license (sección derecha).

Figure 1. Observation site (black dot) where a Cat-eyed snake, *Leptodeira* sp. aff. *ornata*, predated a Common House gecko, *Hemidactylus frenatus*, at the Atenas campus of Universidad Técnica Nacional, Balsa, Atenas County (highlighted in red) in Alajuela Province (outlined in white but shown in red on the map of Costa Rica). Figure based on Google Earth (left section) and Wikipedia under the Creative Commons Attribution-ShareAlike 3.0 license (right section).

Figura 2. Una serpiente ojigata, *Leptodeira* sp. aff. *ornata*, consumiendo un geco común, *Hemidactylus frenatus*, capturado dentro de un refrigerador en un dormitorio en el campus Atenas, Universidad Técnica Nacional, Balsa, cantón de Atenas Alajuela, Costa Rica. Foto: Kevian Quirós Mena.

Figure 2. A Cat-eyed snake, *Leptodeira* sp. aff. *ornata*, consuming a Common House gecko, *Hemidactylus frenatus*, captured inside a fridge of a dormitory at the Atenas campus, Universidad Técnica Nacional, Balsa, Atenas County, Alajuela, Costa Rica. Photo: Kevian Quirós Mena.

and their prey (Zipkin et al., 2020), as evidenced by the decline in a snake community following the disappearance of amphibian communities in the same area (Griesbaum et al., 2023). Despite this, certain herpetofauna, including snakes, show adaptability to human-impacted habitats and exploit common and even introduced species (Marín & Mora, 2019).

Predators' choice of prey is influenced by their hunting behavior and the types of habitats they inhabit (Van Sluys & Rocha, 1998; Marín & Mora, 2019). The invasion of new habitats by native or non-native species creates novel predator-prey relationships, particularly noticeable in opportunistic species residing in human settlements. Such settlements often offer abundant and unconventional resources for certain species (Marín & Mora, 2019).

Various species of geckos, such as the Common House gecko, have been introduced globally and are often found indoors (Neogi & Islam, 2017). These geckos are commonly observed at night clinging to walls, doors, and other surfaces near electric lights (Lee, 2000), where they can be exposed to predation by the Cat-eye snake.

Another key point is that, unlike the Black-banded Cat-eyed snake, *L. nigrofasciata* Günther, 1868, which constricted a Yellow-bellied gecko *Phyllodactylus tuberculosus* Wiegmann, 1834 with loops around its body (Mora et al., 2020), this snake did not employ such constriction. *Leptodeira* sp. aff. *ornata* ingested the Common House gecko starting from the tail, whereas the Black-banded Cat-eyed snake began ingesting the Yellow-bellied gecko from the head (Mora et al., 2020). Ingestion time in this case was 6 min compared to 31 min for the Black-banded Cat-eyed snake.

This finding suggests potential foraging behavior of *L.* sp. aff. *ornata* in semi-urban areas, highlighting another instance of opportunism in its dietary preferences. Documenting instances of predation by this species is crucial for better understanding its typical and unusual feeding patterns, including activity periods, preferred substrates, and types of prey.

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