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Reporting Cannibalistic Behavior in the Yellow Belly Gecko *Hemidactylus flaviviridis,* Ruppell, 1835 (Reptilia: Gekkonidae), from Ahmednagar District of Maharashtra, India

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Authors' contributions

This work was carried out in collaboration among all authors. Authors DKN and BVD conceptualized and designed the research. Author DKN conducted the experiment and wrote the manuscript. Author BVD has reviewed the manuscript. Authors RJS and VME helped in writing manuscript. All authors read and approved the manuscript.

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ABSTRACT

The purpose of this research is to record, examine and document instances of cannibalistic behavior in the yellow-bellied gecko (*Hemidactylus flaviviridis* Ruppell, 1835) in the Indian state of Maharashtra. Although it hasn't been studied in great detail, cannibalism in reptiles provides

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important insights into the behavioral ecology of species, especially in settings with limited resources. Observation was conducted in semi-urban habitats in Maharashtra. A direct visual encounter was used to document the cannibalism incident. To ascertain the size and age classes of both predators and prey, morphological measures were made. An adult gecko was shown to have engaged in cannibalism. Predation was most common in the premonsoon season when there was little other prey available. Predator geckos were noticeably bigger on average than their prey counterparts. According to the analysis, cannibalism might be a survival tactic used when food supplies are scarce. Behavioral observations suggested that cannibalism was not a regular feeding habit, but rather an opportunistic behavior. The findings of this study offer the proof of cannibalism in the Ahmednagar district of Maharashtra's *Hemidactylus flaviviridis*. The results underscore the species' ability to adapt to changing environmental conditions by implying that resource scarcity may be the driving force behind this behavior. Comprehending these actions is essential for gaining a wider understanding of the species' ecology and could have consequences for managing and conserving them**.**

Keywords: Cannabalism; Hemidactylus flaviviridis; Maharashtra; documentation.

1. INTRODUCTION

A wide range of animal taxa, including insects, amphibians, birds, mammals, and reptiles, are subject to the phenomena of cannibalism, which is the eating of individuals of the same species. Many species of reptiles have been shown to engage in cannibalism, especially when faced with stressful environmental circumstances like scarce food supplies, dense populations, or territorial conflicts [1,2]. In environments where resources are scarce, cannibalism in reptiles is frequently viewed as an opportunistic behavior that aids in survival [3]. Although it is known to occur in many different species of reptiles, little is known about cannibalism in the yellow-bellied gecko (*Hemidactylus flaviviridis* Rüppell, 1835). The yellow-bellied gecko, *H. flaviviridis*, is a widely distributed species in South Asia, commonly inhabiting urban, semi-urban, and rural environments [4]. This species is well-known for its ability to adapt to landscapes altered by humans, where it frequently coexists with other species of gecko [5]. Although *H. flaviviridis* is a common sight in many parts of India, little is known about its behavioral ecology, especially with regard to how it feeds in different environments. Ecological factors such as high population density, environmental stress, and scarcity of prey are generally associated with cannibalism in reptiles [6,1]. Studies on snakes and lizards have revealed that when there are few other food sources or when individuals are close to one another because of habitat restrictions, cannibalism may happen more frequently [7,8]. Particularly in early stages when resource competition is fierce, cannibalism has occasionally been seen as a strategy of eradicating rivals [9]. But the environmental causes and effects of cannibalism in *Hemidactylus* There hasn't been a thorough investigation of *flaviviridis*. Cannibalism in geckos, including species belonging to the Hemidactylus genus, has been documented in a number of studies. [10], for instance, reported on the cannibalistic behavior of the introduced *Hemidactylus frenatus* in Hawaii, pointing out that cannibalism was more common in settings where there was a scarcity of available prey. Comparable actions have been noted in other species of gecko, where young geckos are frequently the most susceptible to adult cannibalism [11,12]. Nevertheless, there is a knowledge gap about the behavioral ecology of Hemidactylus because the majority of these studies have concentrated on species that are not found in the Indian subcontinent. *flaviviridis* within its natural habitat. The goal of this study is to close this gap by methodically recording cannibalism cases in *H. flaviviridis* in the Indian state of Maharashtra. The purpose of this study is to shed light on the frequency and conditions of cannibalism as well as any potential ecological drivers of this behavior. This study will advance knowledge of Hemidactylus adaptive strategies by analyzing the environmental factors, such as prey availability and population density, linked to cannibalistic incidents. *flaviviridis* in ecosystems within cities. Recognizing Hemidactylus cannibalism. *Flaviviridis* is important for a number of factors. First of all, it sheds light on how adaptable the species' behavior is, especially in response to shifting environmental circumstances. Second, given how quickly urban areas are growing, especially in states like Maharashtra, it's critical to comprehend how species like *H. faviridis* adjust to these modifications. Because cannibalism affects both

the overall population structure and juvenile survival rates, it may have an impact on population dynamics [6,1]. Documenting this behavior also advances our understanding of the species ecology, which is crucial for managing and conserving it in environments where humans predominate.

2. MATERIALS AND METHODS

The study was conducted in the Maharashtra region of India. The observation was recorded at PGI Boys Hostel, Mahatma Phule Krishi Vidyapeeth, Rahuri, Ahmednagar, India (19.348016N, 74.643922E). Between April and August, which correspond with the pre-monsoon and monsoon seasons when prey availability tends to vary, observations were made. This time frame was selected in light of earlier research suggesting that seasonal variations in prey abundance may have an impact on the feeding habits of reptiles, including cannibalism [13,14]. The main technique for gathering data was making direct visual observations of *H. flaviviridis* individuals between 1900 and 2300 hours, which is when these nocturnal geckos are most likely to hunt and eat, during their active hours [15]. With a flashlight, observations were made so as not to spook the geckos. When cannibalism was detected, the predator gecko was taken for additional examination. Soft traps were used during the capture process to reduce the animal's stress and injuries. The weight and snout-vent length (SVL) of the captured geckos were measured, and pictures were taken to record any unique characteristics or wounds.

3. RESULTS AND DISCUSSION

The observation below was made at PGI Boys Hostel, MPKV, Rahuri. (19.348016N, 74.643922E) in Ahmednagar, India. At approximately 2230 h on 28 April 2024, We observed a mature *Hemidactylus flaviviridis* (SVL around 5 cm), preying on a juvenile conspecific (SVL about 2 cm). Initially, we heard a high-pitched chirp sound and discovered the adult gecko near a tube light on the wall of room. The gecko had a tight grip on the forearm of the juvenile gecko, as shown in the image. (Fig. 1). The juvenile stayed immobile as the adult gecko adjusted and tightened its grip. The adult gecko consumed the juvenile gradually. The intake was completed at 2237 hrs. We saw the predating gecko in the same spot until 2245 hrs, when it escaped through a crevice in the wall.

It seems there isn't much documentation specifically on cannibalism in the yellow belly gecko *Hemidactylus flaviviridis* However, cannibalism has been observed in other species within the Hemidactylus genus, such as *Hemidactylus frenatus* [16,17,18]. However, to the best of our knowledge, this may be the first documented case of cannibalism by *Hemidactylus flaviviridis* in Ahmednagar district of Maharashtra.

Fig. 1. An adult *Hemidactylus flaviviridis* preying upon a juvenile conspecific

4. CONCLUSIONS

This study describes how the yellow-bellied gecko, *Hemidactylus flaviviridis*, has been found to engage in cannibalism in Maharashtra, India. It also indicates that this behavior is probably an adaptive reaction to environmental stresses like a lack of prey and dense population. The results imply that, especially in urban and semi-urban settings, cannibalism may be important to the species' survival and population dynamics. Comprehending these actions within the rapidly evolving surroundings is essential for the efficient preservation and administration of *H. flaviviridis* in environments dominated by people.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that generative AI technologies such as ChatGPT-4 have been used during writing or editing of manuscripts. Input prompts provided to the generative AI technology include; Give information on cannibalistic behavior in geckos, How to tale SLV measurement.

Details of the AI usage are given below:

1.ChatGPT-4 for getting information on cannabilistic behavior of geckos

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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