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Frugivory in *Ameiva ameiva* (Squamata: Teiidae) in a white-sand ecosystem of Central Amazonia, Brazil

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Resumo

Observações e registros de história natural de répteis são cruciais para a compreensão da sua ecologia, especialmente dada a rápida perda de habitat na Amazônia. Embora o lagarto teiídeo *Ameiva ameiva* seja um forrageador ativo com uma dieta amplamente documentada como baseada em artrópodes, existem registros de plasticidade alimentar que incluem o consumo de matéria vegetal. Aqui, documentamos a primeira observação de *A. ameiva* consumindo o fruto *'umari' (Poraqueiba sericea)* em um ecossistema de areia branca (EAB) na Amazônia Central, Brasil. O lagarto foi observado ativamente consumindo a polpa do fruto caído, sugerindo que o *'umari'*, rico em lipídios e carotenoides, pode servir como uma fonte de energia alternativa ou suplementar. Esta observação expande a dieta conhecida de *A. ameiva* e levanta a possibilidade de que esta espécie atue como um dispersor de sementes de curta distância, contribuindo para as interações ecológicas em habitats pouco estudados como os EAB.

Palavras-chave

História natural; Interação animal-planta; Lagarto; Plasticidade alimentar.

ABSTRACT

Observations and natural history records of reptiles are crucial for understanding their ecology, especially given the rapid habitat loss in Amazonia. Although the teiid lizard *Ameiva ameiva* is an active forager with a diet widely documented as being based on arthropods, there are records of dietary plasticity that include the consumption of plant matter. Here, we document the first observation of *A. ameiva* consuming the fruit of *'umari' (Poraqueiba sericea)* in a white-sand ecosystem (WSE) in Central Amazonia, Brazil. The lizard was observed actively consuming the pulp of the fallen fruit, suggesting that *'umari'*, rich in lipids and carotenoids, may serve as an alternative or supplementary energy source. This observation expands the known diet of *A. ameiva* and raises the possibility that this species acts as a short-distance seed disperser, contributing to ecological interactions in understudied habitats such as WSE.

Keywords

Animal-plant interaction; Dietary plasticity; Lizard; Natural history

Given the rapid rate of habitat and species loss worldwide, species-based natural history studies are increasingly important for tracking the evolution of biologically significant behaviors and ecological interactions (Tosa *et al.*, 2021). The Amazon rainforest, in particular, is undergoing rapid fragmentation due to human activities (Cabral *et al.*, 2024), underscoring the urgency of documenting ecological interactions (Nori *et al.*, 2018). However, basic natural history and ecological data are lacking for most reptile species (Tosa *et al.*, 2021; Teodoro *et al.*, 2022), even though such information is essential for understanding species' responses to environmental changes and for developing realistic species- and habitat-management strategies (da Silva *et al.*, 2020).

The teiid lizard *Ameiva ameiva* (Linnaeus, 1758) stands out as a widely distributed species found in Central and South America (Uetz *et al.*, 2025), commonly found in degraded and anthropized areas, including urban environments (Vitt *et al.*, 2008). It is an active forager, searching for food rather than relying on ambush predation (Huey & Pianka, 1981). Although dietary studies of *A. ameiva* indicate a primary reliance on arthropods (Vitt & Colli, 1994), reports of alternative food items such as vegetation (leaves and fruits), frogs, and other lizards suggest a broad dietary plasticity (*e.g.* Zaluar and Rocha, 2000; Sales *et al.*, 2011; Valido and Olesen, 2019; Munhoz Sanches *et al.*, 2021; Nino *et al.*, 2021; Lopes Martins *et al.*, 2023). Here, we document, to our knowledge, the first observation and record of *A. ameiva* consuming the fruit of *'umari'* (*Poraqueiba sericea* Tul. – Icacinaceae) in a white-sand ecosystem (WSE) in Central Amazonia.

While Amazonia is predominantly characterized by tropical ombrophilous rainforests (Veloso *et al.*, 1991), a variety of other habitats arise from diverse soil, water, and climate conditions (Terborgh & Andresen, 1998). One such habitat is the WSE, which consists of patchy vegetation, from open grasslands and shrublands to low-stature, closed-canopy forests, that grows on nutrient-poor sandy soils (Adeney *et al.*, 2016). Despite being understudied (Adeney *et al.*, 2016), recent research suggests that WSE supports a high number of endemic, specialist, and undescribed species in various groups, including anurans (*e.g.*, Ferrão *et al.*, 2022; Mônico *et al.*, 2023; da Cunha Martins *et al.*, 2024), birds (*e.g.*, Borges *et al.*, 2016; Capurucho *et al.*, 2020), snakes (*e.g.*, Fraga *et al.*, 2018) and plants (*e.g.*, Fine and Baroloto, 2016; Costa *et al.*, 2020).

On 19 February 2025, at 1302 h, the first author observed an adult *Ameiva ameiva* actively searching for food and investigating a fallen *Poraqueiba sericea* fruit in the Rio Negro Sustainable Development Reserve (RDS Rio Negro, Km 26), Amazonas, Brazil (Fig. 1). A few seconds after the initial observation, the lizard began consuming the fruit pulp in small bites (Fig. 2A). The animal then pushed the fruit with its head, maneuvering it to access uneaten portions (Fig. 2B). While doing so, it appeared alert and attentive to its surroundings, a common trait for *A. ameiva*, which are known to be active and wary foragers (Huey & Pianka, 1981). The lizard was observed removing only the pulp, leaving the seed intact (Fig. 2C – https://youtube.com/shorts/26AK6c-h6Yk). This behavior may have ecological implications, as the mechanical removal of pulp can enhance seed germination by eliminating germination inhibitors commonly present in the fruit's fleshy tissues (Samuels and Levey, 2005).

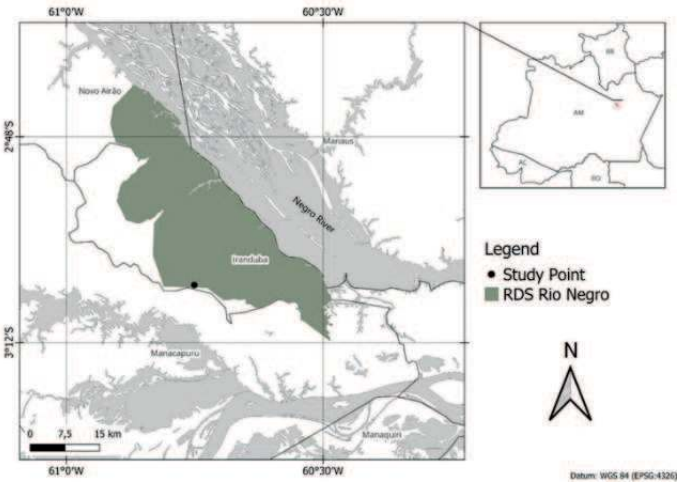

Figure 1. Map of the study area within the Rio Negro Sustainable Development Reserve (RDS), Amazonas state, Brazil. The black point (Study Point) indicates the location where observation was conducted. Datum: WGS 84 (EPSG:4326).

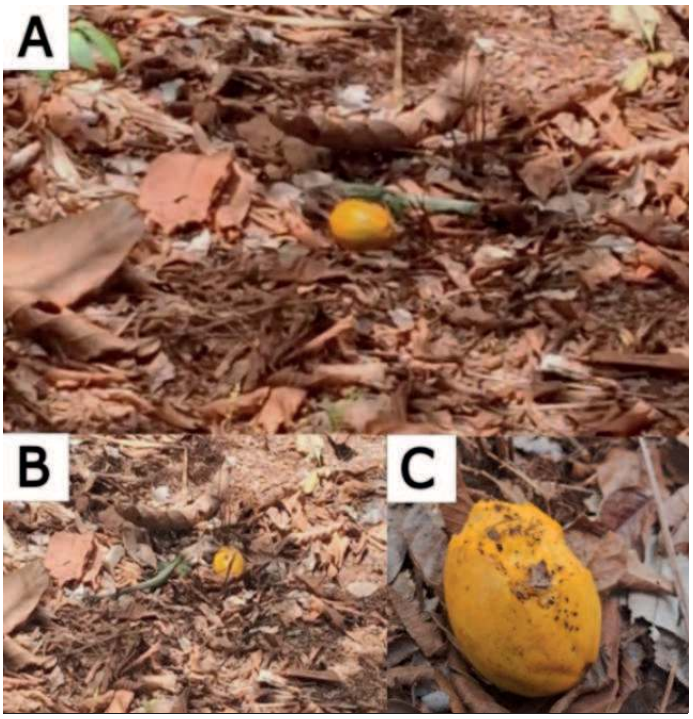

Figure 2. Interaction of *Ameiva ameiva* with fruit of *Poraqueiba sericea* in the study area – **A**. An *Ameiva ameiva* individual in the process of consuming the fruit on the forest floor. **B.** The same individual displacing the fruit to access an unconsumed portion. **C.** Detail of the fruit after partial consumption, showing the marks left by the lizard's feeding.

Fruits of *P. sericea* are relatively large, with an average mass of 54.21 ± 12.51 g, length of 6.53 ± 0.74 cm, and diameter of 3.75 ± 0.32 cm (Ramos *et al*., 2020), making seed ingestion by *A. ameiva* highly unlikely. The fruiting period occurs during the months of highest rainfall, between December and April, with peak productivity from January to March (Coradin *et al*., 2022), which is consistent with our observation made in February. The consumption of *'umari'* fruit, which is rich in lipids and carotenoids, particularly beta-carotene and omega-9 fatty acids (Berto *et al*., 2015; Freitas *et al*., 2024), suggests it may serve as an important energy source for a species that primarily feeds on insects.

This observation represents the first documented case of an *A. ameiva* consuming *P. sericea* fruit. It expands the known dietary breadth of this common lizard and underscores its potential role in seed dispersal. While fruit consumption has been reported in other teiid species (*e.g.*, Alves *et al.*, 2012; Paixão and Venticinque, 2020; Soares-Júnior *et al*., 2024; but see Valido and Olesen, 2019 for a review), our direct observation provides crucial evidence of a specific ecological interaction in WSE. Given the large size of the *P. sericea* seed, *A. ameiva* is unlikely to ingest it whole; however, by consuming only the pulp and subsequently moving the fruit approximately 3 m away from the parent plant, the lizard may facilitate short-distance seed dispersal. Even such limited displacement can reduce density-dependent seed mortality commonly observed beneath parent trees, a process known as the Janzen–Connell effect (Janzen, 1970; Connel, 1971). The consumption of lipid- and carotenoid-rich fruits, like *P. sericea*, could be especially important for *A. ameiva* in highly seasonal environments, serving as a crucial energy source, particularly during the dry season when arthropod availability might be lower. Further research is needed to fully assess the ecological implications of frugivory in *A. ameiva*, particularly its contribution to seed dispersal in Neotropical ecosystems.

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