

## Lizards *Polychrus acutirostris* (Sauria: Polychrotidae) and *Ameiva ameiva* (Sauria: Teiidae) as possible dispersers of the toxic plant *Lantana camara* (Verbenaceae)

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### ABSTRACT

Several species of lizard consume considerable amounts of plant material, and some can be seed dispersers. Between April and May 2021, five lizards were found that had consumed fruit of *Lantana camara*, a female specimen of *Polychrus acutirostris* and four specimens (three males and one female) of *Ameiva ameiva*. *Lantana camara* (Verbenaceae) is a plant naturalized in Brazil found in all regions, including areas of Caatinga, Carrasco, and Cerrado. It has fruit resistant to the digestion of its consumers. In ruminants, its consumption is associated with toxicity, with hepatotoxic and photosensitization effects. Our data present, for the first time, the consumption of these fruit by these two lizard's species and suggest active feeding of *L. camara* as an additional feed resource, indicating that these lizards could be potential dispersers of *L. camara* seeds.

Key Words: Sauria; Carrasco; Diet; Sements, Fruit.

The diet of various lizard species comprises various groups of arthropods and a considerable amount of plant material (Cooper and Vitt, 2002), including fruits and seeds (Castro and Galetti, 2004). These animals can play an important (although still vague) role as seed dispersers (Valido and Olesen, 2019) or pollinators (Gomes *et al.*, 2014), a role widely associated with birds and mammals (Santos *et al.*, 2019).

The lizard, *Polychrus acutirostris* (Fig. 1D) Spix, 1825; (Polychrotidae), is known as “calango-cego,” “papa-vento,” and/or “Lagarto-preguiça” owing to its lethargic movement. It occurs in regions of Brazil such as the Cerrado and Caatinga, with diurnal, arboreal, and foraging habits of the sit-and-wait type (Vanzolini *et al.*, 1980; Garda *et al.*, 2012). The

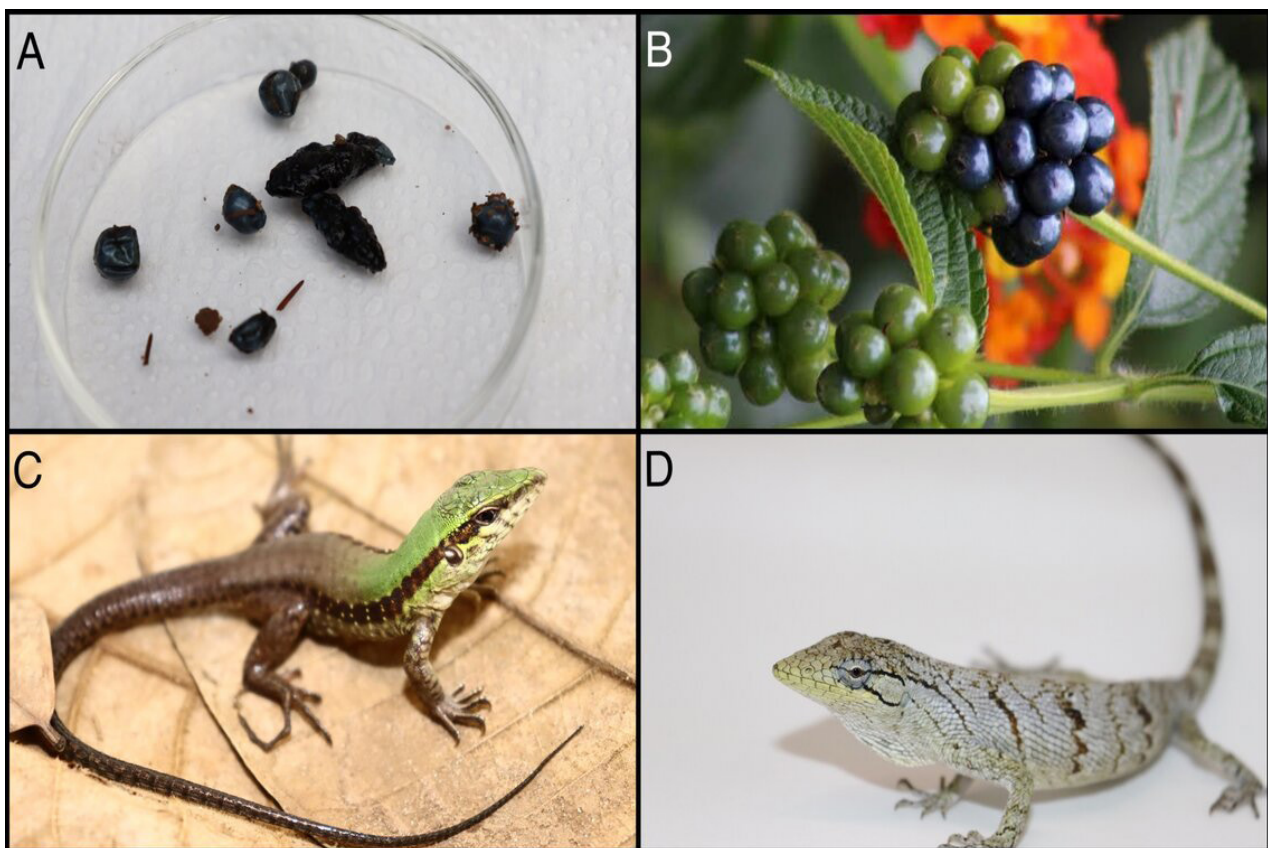
species, *Ameiva ameiva* (Fig. 1C) (Linnaeus, 1758; Teiidae), known as “calango verde” or “tjubina,” occurs in different ecosystems, from the semi-arid regions of northeast Brazil to the humid forests of the Amazon Basin, and occurs in anthropized areas (Vitt and Colli, 1994). It presents a diurnal, terrestrial, and foraging feeding habit. The adults of this species are more abundant in the Caatinga in rainy periods (Sales *et al.*, 2011; Freitas *et al.*, 2012). Both species have an omnivorous diet, comprising small arthropods and plant material (seeds, flowers, and fruits). The ingestion of plant material by *P. acutirostris* can be considered passive, ingesting when consuming another component of the diet (Vitt, 1995; Cooper and Vitt, 2002; Garda *et al.*, 2012).

Belonging to the Verbenaceae family, the species, *Lantana camara* (Fig.1B), is a naturalized and non-endemic plant of Brazil, found in all regions, including areas of the Caatinga, Carrasco, and Cerrado (Silva and Salimena, 2015). They have fruit that change from green to dark red when ripe, and the seeds are resistant to the digestion of their consumers (Ghisalberti, 2000). In ruminants, their consumption is associated with toxicity with hepatotoxic and photosensitization effects (D'Oliveira *et al.*, 2018).

Between the months of April and May 2021 (the rainy season), an active search was carried out in an area of Carrasco in the Araripe Plateau, Crato, Ceará, Brazil (7°17'29.95" S, 39°34'17.54" W). Five lizards that had consumed fruit (it was possible to see the remains of the digested fruits) of *Lantana camara* were found: one female specimen of *P. acutirostris* (mass = 21g; snout vent length (SVL) = 118.8 mm) and four specimens (three males and one female) of *A. ameiva* (m = 60 g, 65.5 g, 64 g, and 92 g, SVL = 134 mm, 136.6 mm, 130.6 mm, and 139 mm, respectively). Before dissecting, the lizards were euthanized with 2% Lidocaine, fixed

with 10% formalin, and preserved in 70% alcohol. The specimens were deposited in the Herpetological Collection of the Universidade Federal do Cariri (CHERP-UFCA). During the dietary analysis, we found that *A. ameiva* had ingested between two and seven *L. camara* fruit/seeds. Fourteen fruit/seeds had been consumed by *P. acutirostris* (Fig. 1A). This is the first record of consumption of this plant species by the Polychrotidae family. In Teiidae, there is a record of *L. camara* being consumed by the lizard, *Salvator merianae* (Diniz *et al.*, 2021).

In comparison with birds and mammals, lizards are not recognized as seed dispersers (Cooper and Vitt, 2002). The accumulation of new studies on the diet and behavior of animals indicates the opposite (Castro and Galetti, 2004; Fonseca *et al.*, 2012; Passos *et al.*, 2013; Gomes *et al.*, 2016). Although the consumption of plant material by *P. acutirostris* and *A. ameiva* is reported to occur accidentally, the considerable number of fruit and seeds (fourteen in a single individual) that we found suggests active feeding of the fruit, which could be an additional feed resource. This point of view may be suggested



**Figure 1.** A= *Lantana camara* seeds found in the diet of *Polychrus acutirostris*; B= *L. camara* in natura; C= Specimen of *Ameiva ameiva* do Carrasco in the Araripe Plateau, northeastern Brazil; D=Specimen of *Polychrus acutirostris* in the Araripe Plateau, northeastern Brazil; Photos: ACD= Samuel Ribeiro; B= Jefferson T. Souza.

due to the fact that the remains of the diet included only larvae of lepidopterans, beetles and termites that are not seed carriers. In this way, these lizards are potential dispersers of these seeds, which suggests that additional studies should investigate the reproductive success that occurs with seeds that pass through the gastrointestinal tract of these lizards

The toxicity of *L. camara* in ruminants has been reported in cases of excessive ingestion by hungry animals, in which the alkaloids present in the leaves and green fruit produce neurological and hepatic symptoms (Sharma *et al.*, 2007). However, the possible toxicity to the two lizard species should be investigated by the composition of diets with the toxic plant, *L. camara*. The present study addresses questions of feeding behavior to elucidate the natural history of the above mentioned Polychrotidae and Teiidae lizards.

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