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Predation attempt events on *Crotophaga major* (Aves: Cuculidae) and *Thraupis palmarum* (Aves: Thraupidae) by *Oxybelis fulgidus* (Squamata: Colubridae) in the brazilian Amazon

Gustavo Henrique dos Anjos Rodrigues[1], Ivan Alves dos Santos-Jr.[1], Lucas José Clemente Figueira[1], Mayse da Silva Malcher[2], Dilson de Siqueira Pinto-Júnior[3], Edson Varga Lopes[4], Darlison Chagas-de-Souza[5], Tássio Alves Coêlho[5]

[1] Instituto de Ciências e Tecnologia das Águas - ICTA, Universidade Federal do Oeste do Pará, Rua Vera Paz S/N Salé, Santarém, Pará, 68040-255, Brazil.

[2] Laboratório de Ecologia e Comportamento Animal, Universidade Federal do Oeste do Pará, Rua Vera Paz s/n, Salé, Santarém, Pará 68040-255, Brazil.

[3] Graduação em Engenharia Ambiental e Sanitária, Instituto Federal do Pará – IFPA, Rua Universitário, s/n, Maria Magdalena, Itaituba, Pará 68183-300, Brazil.

[4] Laboratório de Ecologia e Conservação, Instituto de Biodiversidade e Florestas (IBEF), Universidade Federal do Oeste do Pará, Rua Vera Paz s/n, Salé, Santarém, Pará 68040-255, Brazil

[5] Laboratório de Estudos Morfofisiológicos e Parasitários, Departamento de Ciências Biológicas e da Saúde, Rod. Juscelino Kubitschek, s/n, Jardim Marco Zero, Macapá, Amapá 68903-419, Brazil.

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ABSTRACT

Predation events are difficult to observe due to the unpredictable nature of the environment and timing, which may result in researchers and observers being unable to document them or having to leave before the event is completed. Here, we present predation attempts on *Crotophaga major* and *Thraupis palmarum* by *Oxybelis fulgidus*. These events provide important aspects that contribute to our understanding of the interspecific relationships between predator and prey that can be observed. In addition, we present *C. major* and *T. palmarum* as potencial novel food items in the diet of *O. fulgidus*.

Key Words: Snakes, Cuculiformes, Passeriformes, Amazon region.

Oxybelis fulgidus (Daudin, 1803) is a snake that is part of the large subfamily Colubrinae, or which forms a monophyletic clade. The genus is also composed of *O. aeneus* (Wagler, 1824), *O. brevirostris* (Cope, 1861) and *O. wilsoni* Villa and Maccranie, 1995 (Lawson *et al.*, 2005; Montingelli *et al.*, 2019; Almeida *et al.*, 2020). It is a member of the family Colubridae and is commonly known as the green vine snake and its distribution covers a wide neotropical range from northern South America to Mexico (Kohler, 2008; Wallach *et al.*, 2014). This species can reach up to 1.6 m for males and 2 m for females and is predominantly diurnal and arboreal, moving through trees and shrubs (Fraga *et al.*, 2013; Almeida *et al.*, 2020).

Oxybelis fulgidus provides excellent camouflage for prey capture, with a long head with a prominent snout, a dark green dorsal coloration, and a light green or yellowish belly (Fraga *et al.*, 2013). Although they are more commonly associated with forest environments, they do occasionally move down to the ground (Martins and Oliveira, 1998; Brown, 2020). *Oxybelis fulgidus* has opisthoglyphous fangs, which it uses to subdue larger and more diverse prey as *Ramphocelus carbo* (Pallas, 1764), *Turdus leucomelas* (Vieillot 1818), *Setophaga castanea* (Wilson, A, 1810) and *Uranoscodon superciliosus* (Linnaeus, 1758) (Valadão *et al.*, 2007; Brown, 2020; Barbosa *et al.*, 2021; Toro-Orozco *et al.*, 2021). Its diet consists of a wide variety of birds,

Author for correspondence: coelho.tassio@gmail.com

representing seventeen families to date, but can also prey on lizards and, more rarely or occasionally, on mammals, insects and frogs (Kohler, 2008; Palmuti *et al.*, 2009; Scartozzoni *et al.*, 2009; Brown, 2020).

The first event of predation attempt ocurring during a recreational activity involving canoeing in a floodplains area in the community of Jarí do Socorro (2°20'8.72"S, 54°53'30.92"W; Datum SIRGAS2000; 7 m a.s.l), in the municipality of Santarém, Pará, Brazil, we encountered an *O. fulgidus* preying on a *Crotophaga major* (Gmelin, 1788) (Fig. 1). The observation lasted about ~8 minutes, during which the snake remained motionless with the already dead (having been envenomated) bird, having already swallowed the head. To avoid interfering with the natural predation process, we left the site. The animals were not collected and the present record is based on visual observation and photographic documentation of the predation attempt.

The second event, occurred during a birdwatching activity in Alter do Chão, Santarém district (2°30'32.03"S, 54°56'44.45"W; datum SIRGAS2000; 36 a.s.l.), when *O. fulgidus* attempted to prey on a juvenile *Thraupis palmarum* (Wied, 1821). The attempt occurred on 7 March 2021 at 9:20 am in a tree about five meters high (Fig. 2). The snake caught the bird by the back, which allowed the bird to make some movements to escape, such as flapping its wings or flapping its legs. After being caught, the bird remained alive for about 10 minutes. After it was determined that the bird was dead, the snake began to turn the bird to get it into a swallowing position, which was a lengthy process and energy consuming process, approximately ~75 minutes. Once the bird was finally in the correct position, it began to swallow from the top of its head, but at some point the bird fell out of its mouth and the snake gave up and left. The ants on the ground devoured the bird. Here we present the first record of predation attempt event of *T. palmarum* by *O. fulgidus*.

Crotophaga major is a bird belonging to the family Cuculidae. It is a medium-sized bird, commonly known as the Greater Ani, reaching a length of up to 46 cm from head to tail (Sick, 2001). Its distribution range extends from Panama to Argentina, with a wide distribution in the entire Brazilian territory, where it occupies areas close to water, wetlands and dense forests along rivers, swamps and mangroves (Sick, 2001).

Thraupis palmarum is a bird of the Traupidae family, measuring approximately 18 cm, with greenish

Figure 1. Predation attempt of Great Ani *Crotophaga major* by green vine snake *Oxybelis fulgidus* in Jarí do Socorro region, Santarém municipality, Brazil.

plumage and strongly associated with palm trees (Sick, 1997), being popularly known as Palm Tanager. It is found in a part of Central America (Costa Rica) and has a wide distribution in South America, being present in all the regions of Brazil (Sick, 1997).

Field observations are necessary to provide important information on diet and foraging behavior, as well as other predator-prey interactions (Smith and Atkinson, 2017). Although *C. major* is widely distributed, there is little information on predation on adult individuals, with the exception of a record in the Panama Canal where American crocodiles (*Crocodylus acutus* Cuvier, 1807) were able to prey on some individuals (Riehl, 2020). However, nest predation is more common and has been documented in several studies (Riehl and Jara, 2009). Therefore, this document records the predation attempts of two birds, *C. major*, which would correspond to the highest predation record for *O. fulgidus*, and *T. palmarum*, by *O. fulgidus*, which may indicate these species as potential prey for this snake.

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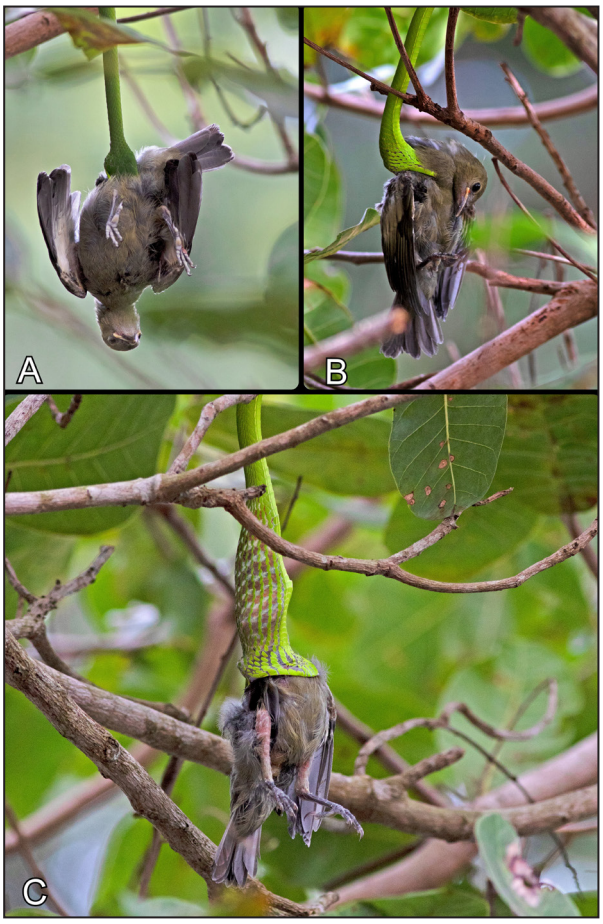

Figure 2. Predation attempt event of Palm Tanager *Thraupis palmarum* by green vine snake *Oxybelis fulgidus* in Alter do Chão, district of Santarém municipality, Brazil. (A) The moment of capture of a juvenile *Thraupis palmarum* by *Oxybelis fulgidus*. (B) Rotation of the bird's head into the correct position for swallowing. (C) Initiation of swallowing by the bird.

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