



Predation on Gliding Treefrog (*Agalychnis spurrelli*) Eggs by Central American White-faced Capuchins (*Cebus imitator*) on Costa Rica's Osa Peninsula

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Anuran eggs are often nutritionally rich, sessile, nontoxic, and easy to attack (Orians and Janzen 1974), making them ideal prey for a number of predators including a number of invertebrates, fish, anurans, reptiles, birds, and mammals (e.g., Savage 2002; Wells 2007; Güell and González 2019). Despite their salient characteristics as prey, natural history observations of predation on anuran eggs of elusive and less well-studied species remain poorly documented. We herein present observations of predation on Gliding Treefrog (*Agalychnis spurrelli* Boulenger 1913) eggs by Central American White-faced Capuchins (*Cebus imitator* Spix 1823) on Costa Rica's Osa Peninsula.

At about 1100 h on 23 May 2018, BAG and KG observed a small troop of Central American White-faced Capuchins feeding on recently laid Gliding Treefrog eggs at Shampoo Pond (8.415278, -83.345833), a lowland tropical rainforest pond (Güell et al. 2019) on Costa Rica's Osa Peninsula (Fig. 1A–B). At least five capuchins were eating eggs directly from the leaves of a large fig tree. Some individuals tore leaves with egg masses off branches, took them to a larger branch, set the leaves down with the eggs facing up, and ate the eggs (Güell and González 2024). Other capuchins held torn leaves in their hands and ate eggs directly off them; we never saw capuchins use their hands to pluck eggs off leaves. Video recordings showed embryos hatching in response to disturbances by capuchins (Güell and González 2024), indicating that embryos were at least four days old, since mechanosensory-cued hatching begins at this stage (Güell and Warkentin 2023a).

Between 1500 and 1530 h on 29 June 2024, HF observed two adult capuchins eating *A. spurrelli* eggs from leaves of a Tunu Rubber Tree (*Castilla tunu*) and an American Oil Palm Tree (*Elais oleifera*) (Figs. 1C–D). Both capuchins consumed

eggs using similar methods as those observed previously, holding detached leaves with both hands and eating eggs off them. Closer inspection of the eggs on the leaves revealed that the embryos were at an early developmental stage during which embryos are distinct from yolks but no melanophores are visible, indicating that embryos were one or two days old (Warkentin 2017; Güell et al. 2024).

Typical reproduction of *A. spurrelli* at this site involves massive explosive-breeding aggregations comprising several thousand individuals on a few trees and palms that overhang Shampoo Pond (Thompson et al. 2016; Güell and González 2019; Güell et al. 2019). These events are triggered primarily by heavy rainfall (> 90 mm) during the previous 24–48 h at the onset of the rainy season (Güell and Warkentin 2023a), and the high densities of adults, eggs, and subsequently tadpoles and metamorphs attract a large number of predators (Güell and González 2019). Many of these interactions have been well documented. For instance, Tiger Herons (*Tigrisoma mexicanum*) and Spectacled Caimans (*Caiman crocodilus*) prey opportunistically on adults during explosive breeding events (Güell et al. 2019). Eggs are eaten by Savage's Thin-toed Frogs (*Leptodactylus savagei*) (Nuñez et al. 2022), Northern Cat-eyed snakes (*Leptodeira ornata*) (Gomez-Mestre and Warkentin 2007; Güell and Warkentin 2023b), and countless other species including Purple Gallinules (*Porphyrio martinica*), social wasps (*Polybia rejecta*), and several kinds of ants, crickets, katydids, and cockroaches (BAG, pers. obs.). Hatchlings are eaten by dragonfly (Anisoptera) larvae, giant water bugs (Belostomatidae), fishing spiders (*Dolomedes* spp.), White-lipped Mud Turtles (*Kinosternon leucostomum*), and American Pygmy Kingfishers (*Chloroceryle aenea*) (BAG, pers. obs.), and Tailless Whip Scorpions (*Paraphrynus laevisfrons*)



Figure 1. Predation of Gliding Treefrog (*Agalychnis saltator*) eggs by Central American White-faced Capuchins (*Cebus imitator*) on 23 May 2018 (A & B), and on 29 June 2024 (C & D), at Shampoo Pond on Costa Rica's Osa Peninsula. The eggs on the leaf in C indicate that embryos were one or two days old. Photographs by Katherine González (A & B) and Hannah Floyd (C & D).

have recently been observed preying on metamorphs (Nuñez and Garro Acuña 2021).

To the best of our knowledge, this is the first record of predation by capuchins on *A. saltator* at any life stage; however, predation by capuchins on adult Misfit Leaf Frogs (*Agalychnis saltator*) (Roberts 1994) and eggs of Red-eyed Leaf Frogs (*A. callidryas*) (Gomez-Mestre and Warkentin 2007) have been documented, but whether capuchins ate eggs directly from leaves or used different methods is unclear. Consumption of small vertebrates by small primates appears to be relatively uncommon (Fedigan 1990; Perry and Rose 1994; Rose 1997). Capuchins are opportunistic generalist omnivores with diets that include amphibians, reptiles, birds, and small mammals (Watts 2020). Our observations of *C. imitator* feeding on *A. saltator* eggs at the same location in different years suggests that capuchins in this region are opportunistically feeding on this low-risk prey during explosive-breeding events.

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