REPTILES & AMPHIBIANS

Predation on a Green-and-Black Poison Frog, *Dendrobates auratus* (Dendrobatidae), by a Wandering Spider, *Ancylometes bogotensis* (Ancylometidae), in southern Costa Rica

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In nature, spiders are active predators of a wide variety of other invertebrates, especially insects and other arachnids. However, a substantial number of spider species are capable of eating small vertebrates, including fish, frogs, lizards, snakes, rodents, and birds (Nordberg et al. 2018; Nyffeler and Altig 2020; Valdez 2020; Núñez Escalante and Moreno Chinchilla 2021). Frog-catching spiders have been documented from all continents except Antarctica, but primarily in Australia and the Neotropics, especially in the forests of Central and South America (Menin et al. 2005; Nyffeler and Altig 2020; Valdez 2020; Oda et al. 2026). The vast majority of frogs captured are small (i.e., 1–6 cm SVL), but all life stages of anuran life cycles are vulnerable to predation by spiders, especially by cursorial hunting species with highly toxic venoms from the superfamilies Ctenoidea and Lycosoidea (Nyffeler and Altig 2020). These spiders usually are active at night, although they may opportunistically capture prey during the day.

About 200 species of frogs from a diverse number of families, including some poisonous species from the family Dendrobatidae, are known to have been captured and consumed by a number of aranean species (Nyffeler and Altig 2020). Frogs of the family Dendrobatidae are characterized by striking aposematic colors and the presence of alkaloids in the skin that act as chemical defenses of variable toxicity against potential predators (Brodie et al. 1978; Summers 1999; Stinosky et al. 2014; Murray et al. 2016). The aposematic colors of poison frogs appear to alert predators with color vision, but little is known about how predators without chromatic vision perceive their defenses (Murray et al. 2016).

In Central and South America, hunting spiders of the family Ancylometidae (formerly included in the family Ctenidae) (Hazzi et al. 2025), especially Wandering Spiders (*Ancylometes bogotensis*), also known as Giant Fishing Spiders or Tropical Wolf Spiders, are well known for their tendency to capture and eat small vertebrates, mainly frogs, fish, lizards, and snakes (Dehling 2007; Nyffeler and Pusey 2014; Folt and Lapinski 2017; Nyffeler and Gibbons 2021; Pérez-Galvis et al. 2024; Fernández Ugalde and Solórzano 2025). This large species is distributed from Honduras in Central America to Bolivia in South America (Höfer and Brescovit 2000; World Spider Catalog 2025). It is relatively common in Costa Rican rain- and dry forests on both slopes where it usually searches for prey in the periphery of bodies of water (Fernández Ugalde and Solórzano 2025).

At 1419 h on 4 July 2025, while in Dos Bocas de Hatillo from Aguirre in Quepos, Puntarenas Province, on the southern Pacific Coast (9.19167, -83.54064), we observed a juve-

Figure 1. A Wandering Spider (*Ancylometes bogotensis*) preying on a juvenile Green-and-Black Poison Frog (*Dendrobates auratus*) in Dos Bocas de Hatillo from Aguirre in Quepos, Puntarenas Province, southern Costa Rica. Photograph by Alex Barboza Elizondo.

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nile Green-and-Black Poison Frog (*Dendrobates auratus*) jump and upon landing be caught by an adult Wandering Spider in the leaf litter of a secondary forest next to a stream. We observed the event for about 15 minutes with no further interaction between the two; neither the frog nor the spider made any apparent attempts to escape. We then returned to the site almost an hour later, and the spider was still holding the frog in the same position and apparently feeding on it. We left the site at that time.

Previous studies suggest that some predators such as ants, spiders, and snakes tend to avoid toxic frogs (including their tadpoles), but sometimes prey on them depending on the concentration of defensive skin alkaloids (Brodie and Tumbarello 1978; Summers 1999; Williams et al. 2003; Stynoski et al. 2014; Murray et al. 2016). According to Stynoski et al. (2014), juveniles of some poison frogs (e.g., *Oophaga pumilio*) apparently are more palatable to certain predators due to lower concentration of defensive alkaloids. Although we did not observe whether predation of the frog was completed by the spider, it likely was successful if this juvenile lacked sufficient chemical defenses.

Records of predation by spiders on anurans continue to increase, as does the diversity of frog species reported as prey, especially in the Neotropics (Toledo 2007; Nyffeler and Altig 2020; Oda et al. 2026). However, presumably because of their defensive chemical weaponry, reports of predation on small dendrobatid frogs are scarce, even though they are known prey of frog-hunting spiders such as tarantulas and wandering spiders, including species in the genus *Ancylometes*.

Lethal toxins and resistance to them are an evolutionary enigma. Selection for greater resistance does not occur if predators do not survive encounters with toxic prey. As has been observed in predator-prey relationships among other groups, such as venomous snakes and certain species of marsupials, for example, the accelerated evolution of toxins is suggestive of a co-evolutionary arms race with resistance to the toxins (Espinosa Guido et al. 2025). Although the predation event described herein was not observed to completion, more research is needed to fully understand the co-evolutionary relationship between the frogs' chemical defenses and resistance to them in predators like this hunting spider.

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