

Maracá-Jipioca Ecological Station, on a coastal island located in Amapá State, Brazil (2.00470°N, 50.43670°W, WGS 84), we found the spider *Avicularia* sp. (Theraphosidae) grasping an individual of the frog *A. hylaedactyla* ventrally with its pedipalps and chelicerae. Within a few minutes the frog was motionless with its legs outstretched (Fig. 1). The observation lasted eight minutes. The spider and frog were photographed, but were not collected. Reports of the spiders of the genus *Avicularia* preying on frogs have not previously been reported. In addition, this is the first record of predation of this frog species by *Avicularia* sp.

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AGALYCHNIS CALLIDRYAS (Red-eyed Tree Frog). PREDATION. *Agalychnis callidryas* inhabits lowland wet forests from southern Mexico to Panama. Females typically lay their eggs on plants as well as on human-made structures that overhang seasonal ponds, allowing tadpoles to fall into the water upon hatching. Like many amphibian species, *A. callidryas* eggs are highly vulnerable to a diverse range of predators, including snakes, wasps, monkeys, and fly larvae (Warkentin 1995. Anim. Behav. 60:503–510). Harvestmen primarily prey upon small soft-bodied arthropods, but they have also been observed feeding on earthworms, slugs, plant matter, and small vertebrate carcasses (Acosta and Machado 2007. In Pinto-da-Rocha et al. [eds.], The Biology of Opiliones, pp. 309–338. Harvard University Press, Cambridge, Massachusetts). To our knowledge, however, there are no previous observations of harvestmen feeding on the eggs of any species. Here we report what we believe to be the first observation of frog eggs being attacked and consumed by harvestmen (Arachnida: Opiliones).

At 2200 h on 1 July 2016, at La Selva Biological Station in Heredia, Costa Rica (10.43060°N, 84.00700°W; WGS 84), we observed three individual harvestmen (*Prionostemma* sp.) preying upon *A. callidryas* eggs. In all three cases, the eggs had been laid on artificial structures, including a metal railing and a plastic water tank near forest and swamp habitats. The harvestmen had the eggs partially in their mouths and, upon being startled, they picked up and carried the eggs while relocating. The gelatinous casings of the eggs were consumed over the course of several minutes, but we did not observe the direct predation of the embryos themselves. Despite not being directly consumed, this process is likely to lead to embryo death via nutrient loss, desiccation, or translocation away from the water.

Studying egg predation in *A. callidryas* is particularly interesting because tadpoles of this species have been shown to hatch early in response to predatory cues (Warkentin 2005. Anim. Behav. 70:59–71). It will be interesting to see if *A. callidryas* embryos have specific adaptations for detecting harvestmen predators. *Prionostemma*, in particular, is the most abundant genus of harvestmen at La Selva Biological Station and is likely to be common in other Neotropical rainforests as well (Proud et al. 2012. ISRN Zool. 2012:549765).

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ANAXYRUS CANORUS (Yosemite Toad). LARVAL DIET. *Anaxyrus canorus* is a North American bufonid that breeds in ephemeral meadow ponds of the high elevation Sierra Nevada of California. Bufonid larvae are known to opportunistically scavenge dead conspecifics and other animals, which can increase their rate of growth and development (McDiarmid 1999. Tadpoles: The Biology of Anuran Larvae. University of Chicago Press, Chicago, Illinois. 444 pp.). Previous researchers have documented *A. canorus* larvae feeding on a variety of dead animals, including conspecific tadpoles, a *Pseudacris sierra* tadpole, a predaceous diving beetle larva, and a dead ground squirrel (Martin 1991. In Staub [ed.], Proceedings of the Northern California Herpetological Society 1991 Conference on Captive Propagation and Husbandry of Reptiles and Amphibians, pp. 17–32. Northern California Herpetological Society, Sacramento, California; Chan 2001. Herpetol. Rev. 32:101). Tadpoles have also been observed feeding on lodgepole pine pollen grains (Martin 1991, *op. cit.*).

Herein I present additional feeding observations of larval *A. canorus*, made during research conducted across the Sierra Nevada during 2006–2016. The first set of observations concerns non-native trout, which sometimes co-occur with *A. canorus* but have been shown experimentally to find *A. canorus* tadpoles distasteful. At ca. 1400 h on 9 July 2008, along the grassy margins of Sandpiper Lake in Sierra National Forest, Fresno County, California, USA (37.31008°N, 118.85203°W, WGS 84; 3188 m elev.), I observed *A. canorus* tadpoles scavenging on a dead trout of unknown species (Fig. 1). I observed this behavior a second time at 1300 h on 1 September 2011, in a small shoreline meadow near Sapphire Lake, Kings Canyon National Park, Fresno County, California, USA (37.15555°N, 118.69492°W, WGS 84; 3350 m elev.).

The second set of observations concerns adult toads. At 1230 h on 22 July 2011, at a mid-elevation meadow 0.75 mi W of Saddle Horse Lake in Yosemite National Park, Tuolumne County, California, USA (38.00204°N, 119.58549°W, WGS 84; elev. 2688 m), I observed *A. canorus* tadpoles consuming a dead adult conspecific of unidentified sex. I witnessed this behavior



FIG. 1. Tadpoles of *Anaxyrus canorus* scavenging on a dead trout in the shallow margin of a lake, Fresno County, California, 9 July 2008.



FIG. 2. Tadpoles of *Anaxyrus canorus* scavenging on a dead adult female toad in a meadow pond, Tuolumne County, California, 24 June 2014.

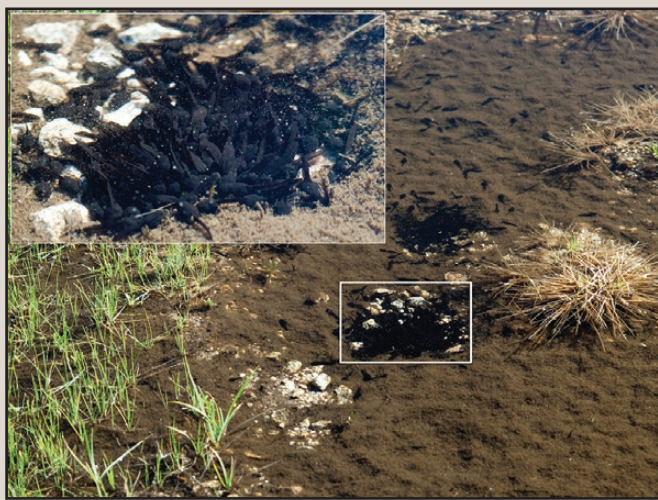


FIG. 3. Tadpoles of *Anaxyrus canorus* forming tight aggregations around sick or injured tadpoles in a meadow pond, Tuolumne County, California, 28 June 2012. Inset shows detail of one aggregation, notice tadpoles are oriented toward the bottom-center.

a second time in a subalpine meadow 2.5 mi W of Tioga Pass, also within Yosemite National Park (37.92065°N, 119.30364°W, WGS 84; elev. 3193 m). At 1630 h on 24 June 2014 I observed *A. canorus* tadpoles scavenging on a dead adult conspecific female toad (Fig. 2).

In all preceding observations, the tadpoles were swimming in and around the dead animal, and removing chunks of flesh. There was no apparent reason for any of the mortalities, but the tadpoles appeared to be scavenging opportunistically.

On one occasion I observed tadpoles engaging in opportunistic coprophagy. At 1630 h on 9 June 2013, in a montane meadow 1.25 mi E of Turner Meadow in Yosemite National Park (37.61201°N, 119.58503°W, WGS 84; elev. 2400 m), I observed tadpoles consuming deer scat.

On multiple occasions during the summers of 2010–2014, I observed *A. canorus* tadpoles scavenging dead conspecific eggs, without witnessing any evidence of active cannibalism. One particular observation suggests that such cannibalism

may sometimes occur. At 1730 h on 28 June 2012 I observed tadpoles aggregated into two tight feeding clusters (Fig. 3) in a montane meadow pond in Yosemite National Park (37.97863°N, 119.37228°W, WGS 84, 2851 m elev.). I disturbed the clusters to find the source of the frenzy, but no dead animals were visible. Instead, 1–2 tadpoles missing bits of tail fin were observed swimming away. I suggest that sick or injured tadpoles may secrete chemical attractants that help to promote conspecific cannibalism, but this hypothesis needs to be pursued further.

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***DENDROPSOPHUS BRANNERI* (Little Frog). PREDATION.**

Dendropsophus branneri is a small hylid frog that inhabits permanent and temporary ponds. The species is widely distributed throughout the Atlantic Forest and Caatinga, occurring along the Brazilian coast from Maranhão to Rio de Janeiro (Lutz 1973. Brazilian Species of *Hyla*. University of Texas Press, Austin, Texas. 265 pp.; Ab'Sáber 1977. Geomorfologia 52:1–21). Anurans are preyed upon by a great diversity of vertebrates such as fishes, lizards, snakes, mammals and birds (Duellman and Trueb 1994. Biology of Amphibians. John Hopkins University Press, Baltimore, Maryland. 670 pp.), as well as invertebrates, mainly arachnids and hemipterans (Toledo 2005. Herpetol. Rev. 36:395–400). At ~1900 h on 9 May 2018, near a temporary pond at the Integral Protection Conservation Unit Mata do Camucim, São Lourenço da Mata county, state of Pernambuco, northeastern Brazil (8.03334°S, 35.21667°W; WGS 84), we observed an adult male *D. branneri* being preyed upon by an adult spider of the species *Nephila clavipes*, which is frequently found at the edges of forest clearings, streams and watercourses, and preys mainly on flying insects such as flies, bees, wasps and lepidopterans (Robinson and Mirick 1971. The Predatory Behavior of the Golden-Web Spider *Nephila clavipes* (Araneae: Araneidae). Psyche 78:123–139). The spider was found on its web while forming a digestive cocoon around its immobile prey, which had its body still intact, making it possible to identify both species involved in the interaction. The specimens were not collected, only photographed and filmed, and these records are now held by the UFRPE Herpetological and Paleo-herpetological Collection (CHP-UFRPE 69999).

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***DENDROPSOPHUS PELIDNA* (Betania's Andean Treefrog).**

DIET. *Dendropsophus pelidna* is a medium-sized Hylid inhabiting the Colombian and Venezuelan Andes, specifically in the state of Táchira, Venezuela, and in the departments of Boyacá and Norte de Santander, Colombia, with an altitudinal distribution between 2220 and 3000 m (Duellman 1989. Occ. Pap. Kansas Mus. Nat. Hist. 131:1–12). This species is nocturnal with a preference for ponds in open areas such as pastures and urban areas, and is very abundant (Guarnizo et al. 2012. Herpetologica 68:523–540).