

NATURAL HISTORY NOTES

GYMNOPIA — CAECILIANS

GYMNOPIA MULTIPLICATA (Varagua Caecilian). BIRTH. *Gymnopsis multiplicata* is a viviparous caecilian that provides post-birth maternal attendance to newborns (McCranie and Wake 2010. Herpetol. Rev. 41:483), which number 2–10 per clutch (Wake 1988. Cat. Amer. Amphib. Rept. 411.1–411.2). At 1715 h on 07 April 2012, we collected an adult female *G. multiplicata* (MVZ 269228, SVL = 328 mm, 115 primary annuli, 92 secondary annuli) and two neonate *G. multiplicata* (MVZ 269229, SVL = 107 mm, 120 primary annuli, 102 secondary annuli; MVZ 269230, SVL = 109 mm, 117 primary annuli, 98 secondary annuli) under a small wooden plank in the backyard of Hotel Río Indio Lodge, Departamento Río San Juan, Nicaragua (10.9303°N, 83.7272°W, datum WGS 84; elev. 20 m). Upon turning the plank with a rake we observed the adult female lying alongside one of the neonates and in the process of giving birth to a second neonate, which was approximately halfway out. Immediately after being exposed, the adult female tried to escape by quickly crawling away and was collected and deposited in a plastic bag. The birth of the second newborn was completed within three to five minutes, and we kept all three specimens together in a plastic bag partially filled with soil for approximately sixteen hours before preservation. No additional young were born. While examining the preserved specimens in the lab, M. H. Wake noticed that the adult female had one more intraoviductal fetus of approximately the same size as the other two newborns. The first two hatchlings came from the female's right oviduct, which was fully evacuated, and the remaining fetus was in the left oviduct. Assuming that these three fetuses constituted the whole clutch, it appears that the adult female *G. multiplicata* emptied one oviduct entirely before the other. Although the Río San Juan is one of the rainiest places in Central America and is included within Lowland Wet Forest

formation, this field observation was made during the driest period of the year. This observation occurred on a day with overcast skies, but no rain, and the soil under the plank was relatively dry. No obvious food items were present.

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CAUDATA — SALAMANDERS

ANEIDES AENEUS (Green Salamander). DEATH FEIGNING/IMMOBILITY. The evolution of anti-predatory behaviors is an important component of the natural history of plethodontid salamanders. At 1325 h on 15 April 2013 in Powell Co., Kentucky, USA (37.816944°N, 83.680496°W, datum WGS84; elev. 381 m), we observed an adult *Aneides aeneus* (SVL = 5.5 cm) display immobility shortly after capture in a behavior we interpret as death feigning. The animal was gently coaxed from a cliff crevice using a small twig and quickly captured upon egress. Once in hand, within 15 seconds of capture, the animal flipped onto its back and lay limp for over three minutes. After about one minute, the animal gaped its mouth and assumed a more rigid posture. Once returned to the cliff, the animal quickly retreated into a fissure.

Anti-predatory behaviors such as immobility in response to physical contact and flipping onto the back have been reported for hatchling *Aneides* (Brodie et al. 1974. Herpetologica 30:79–85), but to our knowledge this is the first reported instance of death feigning or immobility upon contact in an adult *Aneides*. This genus is highly adapted to an arboreal existence and a primary mode of defense against predators is to wedge the body tightly into cracks and crevices (Petranka 1998. Salamanders of the United States and Canada. Smithsonian Inst. Press, Washington, D.C. 587 pp.). Our observations suggest that death feigning may offer a second line of defense to *Aneides* if animals are extracted from their hiding places by a predator. The behavior we observed resembles Unken reflex but it differs in the strict sense because the ventral surface of *Aneides* is not brightly colored.

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FIG. 1. Adult female *Gymnopsis multiplicata* with two neonates.

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