



## FIELD NOTE

# Predation of a Central American coral snake (*Micrurus nigrocinctus*) by a nine-banded armadillo (*Dasyus novemcinctus*) in Santa Rosa National Park, Costa Rica

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**Abstract** We describe the manner in which a nine-banded armadillo (*Dasyus novemcinctus*) killed a Central American coral snake (*Micrurus nigrocinctus*) that it subsequently ate. The armadillo repeatedly ran towards, jumped, flipped over in mid-air, and landed on top of the snake with its back until the snake was dead.

**Keywords:** armadillo, behavior, food, predation, snake

**Depredación de una serpiente de coral de América Central (*Micrurus nigrocinctus*) por un armadillo de nueve bandas (*Dasyus novemcinctus*) en el Parque Nacional Santa Rosa, Costa Rica**

**Resumen** En esta nota describimos la manera en que un armadillo de nueve bandas (*Dasyus novemcinctus*) mató a una serpiente de coral de América Central (*Micrurus nigrocinctus*) que posteriormente comió. El armadillo corrió varias veces hacia adelante, saltó, se dio vuelta en el aire y aterrizó sobre la serpiente con la espalda hasta que la serpiente estuvo muerta.

**Palabras clave:** armadillo, comida, comportamiento, depredación, serpiente

Nine-banded armadillos (*Dasyus novemcinctus*) feed mostly on arthropods such as beetles, termites, and ants, but also consume bird eggs and “unusual items” such as fruits, fungi, and small vertebrates (McBee & Baker, 1982; Wetzel, 1991; Carrillo *et al.*, 1999; Loughry & McDonough, 2013). Snakes have been reported in the diet of the armadillo in Louisiana, Alabama, and Florida in the U.S. (Fitch *et al.*, 1952; Breece & Dusi, 1985; Wirtz *et al.*, 1985), and in Bolivia (Salazar-Bravo *et al.*, 2010), but no observations have been reported regarding the manner in which such prey, or any other vertebrate prey, is captured (Loughry & McDonough, 2013:130). Here we describe the predation of a Central American coral snake (*Micrurus nigrocinctus*) by a nine-banded armadillo.

The ~4-kg nine-banded armadillo is distributed from the southeast and central United States to Uruguay and northern Argentina, Granada, Trinidad and Tobago, and the Margarita Islands (Loughry *et al.*, 2014). On the Caribbean and Pacific slope of Costa Rica it lives from sea level to 2,600 m asl in humid and dry forests, wooded areas, and savannas (Vaughan & Shoemaker, 1999), and is mainly nocturnal and solitary. The ~1-m Central American coral snake is distributed from Oaxaca and Chiapas in Mexico to northwestern Colombia, is found on the Pacific Coast of Costa Rica, and is active both day and night (Solórzano, 2004).

The predation event took place around 16:00 hr on 7 December 1985 (temperature ~25°C), at the

beginning of the dry season (December–April), in Santa Rosa National Park, Costa Rica (10°47'59.82"N, 85°38'56.52"W), a dry tropical forest (Janzen & Hallwachs, 2016). As EC walked down a forest path, he heard a noise among the leaves, and a few thuds, about 10 m away from the path. Upon entering the forest, he observed, from a distance of ~5 m, an armadillo that made unusual movements near a live coral snake ~1 m long. The armadillo moved away from the snake 1–2 m and then returned running. Perhaps 0.2 m before reaching the snake, the armadillo jumped ~0.5 m in the air, turned, and fell on the snake, landing on its armored back. The armadillo did that 6 or 7 times until the snake was dead. Then, the armadillo began to eat the snake, a process that lasted approximately 30 min; it consumed the entire snake.

Reptilian and amphibian prey of armadillos includes skinks, anoles, glass lizards, frogs, toads, and salamanders (Fitch *et al.*, 1952; Breece & Dusi, 1985; Wirtz *et al.*, 1985). Given this, it is not surprising that snakes are consumed by armadillos, as well, but it has not been documented frequently. Three small snakes (2 rough earth snakes [*Haldea striatula*, formerly *Virginia striatula*], 1 unidentifiable) were recorded in stomachs of armadillos from Louisiana (Fitch *et al.*, 1952), and another rough earth snake was recorded as armadillo food in Alabama (Breece & Dusi, 1985). In Florida, armadillo stomachs contained water snake (*Natrix* sp.) and garter snake (*Thamnophis* sp.) hatchlings (Wirtz *et al.*, 1985), and a 244-mm specimen of Boettger's ground snake (*Atractus boettgeri*) was found in the stomach of a nine-banded armadillo in Bolivia (Salazar-Bravo *et al.*, 2010). Small whole snakes (~250 mm) also have been recorded in the diet of the yellow armadillo (*Euphractus sexcinctus*) in south-central Brazil (Dalponte & Tavares-Filho, 2004). Vertebrate prey appears to be taken more often in the winter; for reptile and amphibian prey, this may be because these species are ectotherms and they may move more slowly and be more easily caught when it is cold (Loughry & McDonough, 2013:134).

The manner in which the coral snake was crushed by a 4-kg jumping armadillo in Costa Rica seems unique but, given armadillo morphology and behavior, it makes some sense. First, although the carapace may provide some protection against predators (Wetzel, 1991; Loughry & McDonough, 2013:75), it might also provide protection from bites of poisonous snakes. Armadillos are surprisingly speedy and agile, especially over short distances (Loughry & McDonough, 2013:180) and will pounce upon and rip apart larger prey such as grasshoppers (Loughry & McDonough, 2013:179). In addition, armadillos roll on their back to mud bathe (Loughry & McDonough, 2013:182), and when alarmed or about to be captured, an armadillo jumps straight up and arches its back (Talmage

& Buchanan, 1954; Wetzel, 1991); in one case, this behavior was in reaction to discovering a large cottonmouth snake (*Agkistrodon piscivorus*) lying at the base of a tree (Loughry & McDonough, 2013:189). Also, during intraspecific fights, armadillos can jump and flip in the air in attempts to avoid, or deliver, blows (Loughry & McDonough, 2013:191). Thus, armadillos are physically capable of killing snakes in the way that is reported here, but until more foraging armadillos are observed for long periods of time, it is unlikely that such behavior will be confirmed.

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