



Predation of a Speckled Racer, *Drymobius margaritiferus* (Colubridae), by a Common Road Guarder, *Conopsis lineatus* (Dipsadidae), in Northwestern Costa Rica

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The Common Road Guarder (*Conopsis lineatus*), a dipsadid snake that typically ranges from 65 cm to 1 m in total length, is a mildly venomous species with a distribution extending from southern Mexico to northwestern Costa Rica (Boundy 2020). Within Costa Rica, *C. lineatus* is found predominantly in the dry forests of the Pacific northwest, specifically across Guanacaste Province, northern Puntarenas Province, and the western Central Valley in San José Province. Its adaptability to thermal conditions and habitat deforestation is evident in its broad elevational range, which extends from sea level to 1,100 m (Solórzano 2022). *Conopsis*

lineatus exhibits diurnal, terrestrial, and semi-fossorial behaviors, though it has occasionally been observed at low heights in trees and shrubs (Solórzano and Mora Artavia 2015). As an opportunistic predator, its diet is remarkably diverse, encompassing arthropods (primarily ticks and grasshoppers), small mammals (such as rats and mice), anurans (frogs and toads), lizards, small birds, avian and reptilian eggs, and even carrion (Stafford and Henderson 2006; Pérez-Alvarado and Vásquez-Cruz 2021; Salazar Saavedra 2025). Snakes also have been reported, albeit infrequently, as prey, including an individual of its own species and *Thamnophis sirtalis*, *Storeira dekayi*, and



Figure 1. An Adult Common Road Guarder (*Conopsis lineatus*) preying on an adult Speckled Racer (*Drymobius margaritiferus*) in Barra Honda, Nicoya County, Guanacaste Province, Costa Rica. Photographs by Yazmín Días Gómez.

coralsnakes, *Micrurus diastema* and *M. limbatus*, in captivity (Pérez-Alvarado and Vásquez-Cruz 2021).

Speckled Racers (*Drymobius margaritiferus*), another small diurnally active species with a mean size in adults of 75–85 cm in total length, boast a broad geographic distribution that extends from Texas in the southern United States south into northern Colombia (Boundy 2020). In Costa Rica, *D. margaritiferus* is relatively common and widely distributed throughout much of the country at elevations of sea level to 1,600 m. It is typically associated with riparian habitats, such as streams and rivers, and is primarily a frog specialist (Solórzano 2022).

At 1102 h on 14 March 2025, an adult *Conophis lineatus* was observed preying on an adult *Drymobius margaritiferus* in the backyard of a residence near Parque Nacional Barra Honda, Nicoya County, Guanacaste Province, Costa Rica (10.09202, -85.22339). To the best of our knowledge, this represents the first documented case of *D. margaritiferus* in the diet of *C. lineatus*.

The Common Road Guarder was holding the Speckled Racer, presumably injecting venom; it was ingested head-first (Fig. 1). The entire event lasted about 66 min, culminating with the *C. lineatus* consuming its prey and leaving the area. Although precise measurements of the snakes were not taken, both appeared to be of similar length (ca. 65–70 cm). That predator and prey were of similar sizes was not unusual, as ophiophagous snakes such as kingsnakes are able to swallow prey of comparable or even longer sizes than themselves (Greene 1997; Jackson et al. 2004; Greene and Wiseman 2023), something that also has been observed in some coralsnakes (e.g., a *Micrurus mosquitensis* that ate a larger Blunt-headed Treesnake, *Imantodes cenchoa*; A.S., pers. obs.).

The venom of *Conophis lineatus* is known to be rich in matrix metalloproteases and other toxins (Schramer et al. 2022), the most conspicuous effects of which are local and systemic hemorrhages in prey and, in some cases, humans (Gutiérrez and Sasa 2002). Severe bleeding could lead to a reduction in blood pressure and subsequent premature immobilization of prey. Consequently, in this observation, we believe that the venom of *C. lineatus* probably played a substantial role in the rapid immobilization of the racer.

This observation also is consistent with previous reports in which Common Road Guarders constricted their prey (Hernández-Gallegos et al. 2008; Mays 2010). Although constriction and envenomation are traditionally considered alternative methods for prey immobilization by snakes (Greene and Burghardt 1978), numerous records demonstrate that constriction is employed by venomous species (e.g., Rochelle and Kardong 1993). This is particularly evident in elapids (Shine and Schwaner 1985), as well as several opisthoglyphous species in colubroid lineages, including approximately twenty genera of dipsadids (Penning et al. 2023), suggesting that the use of constriction by venomous snakes to immobilize prey

occurs more frequently than often recognized and that this behavior evolved independently in multiple lineages (Shine and Schwaner 1985). The use of constriction could provide an advantage to species with less toxic venom, particularly when targeting prey that have developed resistance to venom or when envenomation acts slowly, as with ectothermic prey, potentially resulting in the escape of prey or injury to the snake.

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