

New observations on diet of the South American two-striped forest-pitviper *Bothrops bilineatus smaragdinus* (Hoge, 1966)

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ABSTRACT

The arboreal, nocturnal and widely distributed snake *Bothrops bilineatus smaragdinus* (Squamata, Viperidae) is known as a generalist whose diet items have rarely been identified to species level. In this work we report three new items for its diet: an adult frog *Dendropsophus marmoratus* (Anura, Hylidae), an adult lizard *Thecadactylus solimoensis* (Squamata, Phyllodactylidae), and an adult bat *Carollia brevicauda* (Chiroptera, Phyllostomidae), the latter being the first record of predation of a Chiropteran by this species.

Key Words: Anurophagy; *Carollia brevicauda*; *Dendropsophus marmoratus*; Diet; *Thecadactylus solimoensis*; Saurophagy.

The venomous snake, *Bothrops bilineatus smaragdinus* (Hoge, 1966), is widely distributed across the western side of the Amazon basin, encompassing Amazonian Colombia and southern Venezuela, northern and western Brazil, eastern Ecuador, Peru and Bolivia (Campbell and Lamar, 2004). With mostly nocturnal habits, it is an arboreal snake with preference of low forest strata and upland *terra firme* forests (Duellman, 1978; Campbell and Lamar, 2004; Turci *et al.*, 2009; Valencia *et al.*, 2016). According to the preys recorded by some authors, *B. b. smaragdinus* feeds on frogs, lizards, birds and rodents (Carrillo de Espinoza, 1983; Cunha and Nascimento, 1993; Martins *et al.*, 2002; Campbell and Lamar, 2004). However, specific identified items in the diet of *B. b. smaragdinus* are rarely reported. Dixon and Soini (1986) found tree frogs *Osteocephalus* and *Hyla* (now *Boana* or *Dendropsophus*) in specimens from near Iquitos, Peru. Valencia *et al.* (2016) found remnants of *Anolis fuscoauratus* and rodents in the stomachs of Ecuadorian specimens.

Herein, we report three new items for the diet of *B. b. smaragdinus*, and the first record of predation of a Chiropteran by this species. The first predation event was observed in February, 2007 by P. Grilli. In this case (Fig. 1), a juvenile of *B. b. smaragdinus* was observed swallowing an adult *Dendropsophus*

marmoratus (Laurenti, 1768) at 1.4 m above the ground on a branch at Cashiriari (11°51'53.4" S; 72°46'45.4" W, 588 m a.s.l.), La Convención, Cusco department, Peru. Both individuals, snake and frog, were not collected.

For the other two records, we examined the stomach contents of two specimens of *B. b. smaragdinus* from the herpetological collection of the Centro de Ornitología y Biodiversidad (CORBIDI), Lima, Peru. In one of these, an adult male (CORBIDI 4799) collected in March 2008 by V. Duran at Corrientes river (03°03'54" S, 75°49'35" W, 2000 m a.s.l.), Andoas, Loreto department, Peru. We found an adult *Thecadactylus solimoensis* (Bergmann and Russell, 2007) (CORBIDI 5077). The prey's measurements were: Snout-vent-length (SVL): 136 mm, Head Width (HW): 19.9 mm and Head length (HL): 27.8 mm. Snake's measurements were: SVL 510 mm, TL 91 mm, HL 21.66 mm and HW 15.46 mm. The other specimen was an adult female (CORBIDI 11169), collected on 7 May 2012 by V. Duran at Malvinas (11°39'16.1" S; 73°1'5.8" W, 400 m a.s.l.), La Convención, Cusco department, Peru. Its stomach contained a recently swallowed adult of *Carollia brevicauda*. The bat measurements were SVL: 55 mm, HW: 9 mm. Snake's measurements were SVL: 657 mm, TL: 64 mm, HW: 12.2 mm.



Figure 1. A juvenile of *B. bilineatus smaragdinus* swallowing an adult *Dendropsophus marmoratus* (Anura, Hylidae) at Cashiriari, La Convención, Cusco department, Peru.

From the dietary items reported here, the bat represents the most interesting record. From the several events of bat consumption by snakes reported for Central and South America, only a small portion belongs to species of the Viperidae family. Previous reports are: *Bothriechis schlegelii* and *Bothrops asper* feeding on the bat *Glossophaga soricina* in Honduras and Mexico respectively (Groves, 1961; Villa and Lopez-Forment, 1966); *Crotallus pusillus* feeding on the bat *Eptesicus fuscus* (Duellman, 1961); and *Bothrops pauloensis* feeding on an undetermined species of bat in Central Brazil (Valdujo *et al.*, 2002). However, Esbérard and Vrcibradic (2007) have pointed out that it is not possible to determine if these records are from predation of live bats or from necrophagy, especially those records obtained from stomach contents.

Although, the bat *Carollia brevicauda* has been

previously reported as prey of another viper species, *Bo. schlegelii*, from western Ecuador (Meza-Ramos *et al.*, 2010), and the broad distribution of this bat species, as reported by Gardner (2007) (known from Panama to Peru, Bolivia and Southeastern Brazil), overlaps with that of *B. b. smaragdinus*; we concluded, that this is the first report of this kind of interaction between both species. The described nocturnal behavior for the bat includes resting in tree holes and hollow roots and having a preference for fruits of the Piperaceae family (Estrada-Villegas *et al.*, 2010; Ramos Pereira *et al.*, 2010). This behavior may indicate a particular predation activity pattern similar to that suggested for *Bo. schlegelii*, being this the selection of ambush sites for success in predation (Sorrel, 2009). If vipers waited near the Piperaceae fruit or near the bats' dens and resting places they would have the opportunity to ambush these bats. We suggest this may be a probable strategy of predation extended to other semi-arboreal pitvipers, such as *B. b. smaragdinus* and a topic worthy of further research.

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