

SHORT NOTE

Updates on the diet items of *Conophis lineatus* (Squamata: Dipsadidae)

Actualizaciones sobre la dieta de *Conophis lineatus* (Squamata: Dipsadidae)

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- Received: 26/Nov/2019
- Accepted: 03/Nov/2020
- Online Publishing: 27/Nov/2020

Citation: Pérez-Alvarado C J. y Vásquez-Cruz V. 2021. Updates on the diet items of *Conophis lineatus* (Squamata: Dipsadidae). *Caldasia* 43(1):197-201. doi: <https://dx.doi.org/10.15446/caldasia.v43n1.83517>.

ABSTRACT

Conophis lineatus is a widely distributed species, from Mexico to Costa Rica, recognized for its wide diet breadth. Here we present two feeding events under natural conditions, as well as a review of literature on the species in the diet of *C. lineatus*.

Keywords. Anura, *Incilius valliceps*, Central american Road Guarder, *Smilisca baudinii*

RESUMEN

Conophis lineatus es una especie con extensa distribución, desde México hasta Costa Rica, reconocida por su amplia dieta. Aquí presentamos dos eventos de alimentación en condiciones naturales, así como una revisión de la literatura sobre las especies en la dieta de *C. lineatus*.

Palabras clave. Anura, *Incilius valliceps*, Guarda Caminos Centroamericana, *Smilisca baudinii*

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Conophis lineatus (Duméril, Bibron and Duméril, 1854) is a colubrid with a distribution on the Atlantic versant from Veracruz and on the Pacific versant from western Chiapas southward to Costa Rica (Heimes 2016). In Mexico there are three subspecies: *C. l. lineatus* (Duméril, Bibron and Duméril, 1854), *C. l. concolor* (Cope, 1867) and *C. l. dunnii* (Smith, 1942). This snake is recognized for its wide diet although having a preference for lizards though; In general, its diet includes toads, frogs, lizards, birds and their eggs, small mammals, snakes, and members of its own species (Pérez-Higareda *et al.* 2007, Heimes 2016). Here, we present a new item in the diet of *Conophis lineatus lineatus* in Veracruz, México as well as a literature review of dietary items *C. lineatus* (*sensu lato*) where at least the genus of the prey is given (Table 1).

On 12 June 2014, around 11:00 h, we found an adult of *Conophis lineatus* preying an adult individual of common toad *Incilius valliceps* (Wiegmann, 1833) (Fig. 1a) in a deciduous forest fragment in the locality Tejeria (19°08'59" N, 96° 13' 11.2" W; WGS 84; elev. 5 m) municipality of Veracruz, Veracruz, Mexico. At the beginning of our observation, the snake was just starting to eat the toad from the head, as an antipredatory method, the toad inflated its body, and the feeding process took about 30 min. The snake had a snout–vent length (SVL) of 870 mm. Subsequently, on 13 June 2014, around 9:00 h, in the same locality, we found an adult of *C. lineatus* (SVL=790 mm) eating a corpse of an adult of *Smilisca baudinii* (Duméril and Bibron, 1841) (previously observed) in a remarkable state of decomposition (Fig. 1b).

For the first observation, we determined the toad species based on two criteria: (1) distribution, which suggest two

potential species *Incilius valliceps* and *Rhinella horribilis* (Wiegmann, 1833) (Oliver *et al.* 2009), (2) the prey had short limbs, narrow head compared to the body, characteristics that *R. horribilis* does not possess (Oliver *et al.* 2009). In the second case, we had previously observed the corpse and, based on its spotted dorsal pattern and the bars on the forelimbs on a bluish-green background, we determined the identity as *S. baudinii* (Duellman, 2001).

Amphibians are an important part of trophic webs, being predators of a great variety of species, as well as prey to a large group of animals (Duellman and Trueb 1994). *Smilisca baudinii* has been reported in several cases of prey-predator interactions with snakes (e.g. Aguilar-López *et al.* 2019), as well as other vertebrates (e.g. Vásquez-Cruz 2020). Nevertheless, few cases of predation have been reported in *Incilius valliceps* (e.g. Avalos-Vela and Vásquez-Cruz 2018), as in other bufonid species (e.g. Hernández-Gallegos *et al.* 2019). It is suggested that the secretion from the glands of certain bufonids causes nausea in vertebrates, shortness of breath, and muscle paralysis, and may even lead to death (e.g. Shine and Wiens 2010).

This represents the first report of predator-prey interaction between *Conophis lineatus* and *Incilius valliceps* and the second record of *Smilisca baudinii* as prey of *C. lineatus* (Greding 1972). Furthermore, this is the first case of *C. lineatus* as scavenger. *Conophis lineatus* is a snake with a wide range of prey species (Table 1), however, it shows preference for lizards of the family Teiidae (Stafford and Henderson 2006), likely because these lizards are very abundant. Our observation of *C. lineatus* as a scavenger suggests a low selectivity, considering any species that it manages to catch as a potential prey.

PARTICIPATION OF AUTHORS

CJPA performed the field work, VVC wrote the manuscript.

INTEREST CONFLICT

The authors declare no conflict of interest

ACKNOWLEDGMENTS

Arleth Reynoso Martínez for valuable suggestions that improved the manuscript, Luis Canseco-Márquez for the verification of the species prey and two anonymous reviewers for their comments from which the manuscript greatly benefited.

Table 1. List of dietary items recorded for *Conophis lineatus*.

Prey	Observation	Country and State	Reference
Anura: Bufonidae			
<i>Incilius luetkenii</i> (Boulenger, 1891)	<i>In situ</i> observation	Costa Rica: Guanacaste Province	Mays 2010
<i>Incilius valliceps</i>	<i>In situ</i> observation	México: Veracruz	This study
Hylidae			
<i>Smilisca baudinii</i>	<i>In situ</i> observation	Costa Rica: Puntarenas Province	Greding 1972
<i>Smilisca baudinii</i>	<i>In situ</i> observation	México: Veracruz	This study
Leptodactylidae			
<i>Engystomops pustulosus</i> (Cope, 1864)	<i>In situ</i> observation	Nicaragua: near León	Villa 1969
<i>Leptodactylus labialis</i> (Boulenger, 1887)	<i>In situ</i> observation	Costa Rica: Guanacaste Province	Villa 1969
<i>Leptodactylus</i> sp.	Dissection	México: Yucatán Peninsula	Stanford and Henderson 2006
Reptiles: Dactyloidae			
<i>Anolis</i> sp.	In captivity	Nicaragua	Henderson and Binder 1981
Iguanidae			
<i>Ctenosaura similis</i> (Gray, 1831)	<i>In situ</i> observation	México: Quintana Roo	Hernández-Gallegos <i>et al.</i> 2008
Phrynosomatidae			
<i>Sceloporus</i> sp.	Dissection	México: Yucatán Peninsula	Stanford and Henderson 2006
<i>Sceloporus</i> sp.	<i>In situ</i> observation	México: Veracruz	Pérez-Higareda <i>et al.</i> 2007
Teiidae			
<i>Aspidoscelis angusticeps</i> (Cope, 1878)	Dissection	México: Yucatán Peninsula	Stanford and Henderson 2006
<i>Aspidoscelis</i> sp.	Dissection	México: Yucatán Peninsula	Stanford and Henderson 2006
<i>Aspidoscelis</i> sp.	<i>In situ</i> observation	México: Veracruz	Pérez-Higareda <i>et al.</i> 2007
<i>Holcosus amphigrammus</i> (Smith and Laufe, 1945)	<i>In situ</i> observation	México: Veracruz	Pérez-Higareda <i>et al.</i> 2007
<i>Holcosus gaigeae</i> (Smith and Laufe, 1946)	<i>In situ</i> observation	México: Yucatán	Gómez-de Regil and Escalante-Pasos 2017
Scincidae	Dissection	México: Yucatán Peninsula	Stanford and Henderson 2006
Dipsadidae			
<i>Conophis lineatus</i>	Not specified	México: Veracruz	Pérez-Higareda <i>et al.</i> 2007
Natricidae			
<i>Thamnophis sirtalis</i> (Linnaeus, 1758)	In captivity	Central American	Mittleman 1944
<i>Storeria dekayi</i> (Holbrook, 1839)	In captivity	Central American	Mittleman 1944
Elapidae			
<i>Micrurus diastema</i> (Duméril, Bibron and Duméril, 1854)	In captivity	México: Veracruz	Rodriguez-Garcia <i>et al.</i> 1998
<i>Micrurus limbatus</i> Fraser, 1964	In captivity	México: Veracruz	Rodriguez-Garcia <i>et al.</i> 1998
Aves: Cuculidae			
<i>Neomorphus geoffroyi</i> Temminck, 1820	<i>In situ</i> observation	Costa Rica	Scott 1983

(Continued)

Table 1. List of dietary items recorded for *Conophis lineatus*.

Prey	Observation	Country and State	Reference
Mammalia: Muridae			
<i>Mus musculus</i> Linnaeus, 1758	In captivity	Nicaragua	Henderson and Binder 1981
Heteromyidae			
<i>Heteromys gaumeri</i> Allen and Chapman, 1897	Dissection	México: Yucatán	Wellman 1963
<i>Heteromys gaumeri</i>	Dissection	México: Yucatán Peninsula	Stanford and Henderson 2006
Artropoda: Ixodidae			
<i>Boophilus microplus</i> Canestrini, 1887	Dissection	México: Yucatán Peninsula	Stanford and Henderson 2006

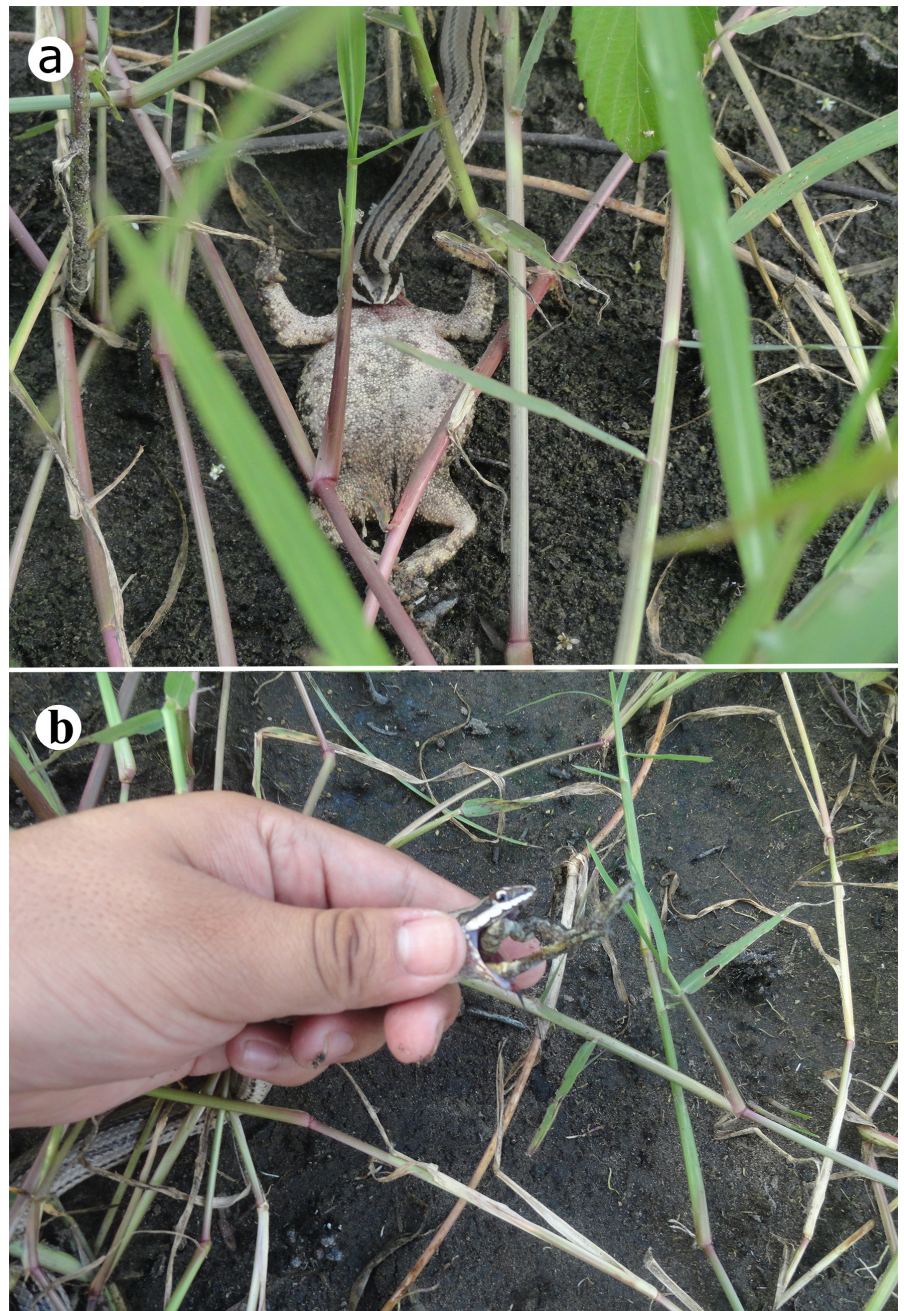


Figure 1. Records of adult *Conophis lineatus* predation events in Veracruz, México. **a.** on an adult *Incilius valliceps* **b.** eating a corpse of adult of *Smilisca baudinii*

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