



Predation on Rainbow Ameivas, *Holcosus undulatus* (*sensu lato*), and a Second Record of Predation on *H. amphigrammus* (Smith and Laufe 1945) by a Terciopelo (*Bothrops asper*) in Veracruz, Mexico

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In a major re-evaluation of the *Holcosus undulatus* complex (generally known as Rainbow Ameivas), Meza-Lázaro and Nieto-Montes de Oca (2015) elevated a number of taxa, including *H. amphigrammus*, to species. *Holcosus undulatus* (*sensu lato*) is a terrestrial teiid of medium size (SVL to 111 mm; Ramírez-Bautista 1997) that is active by day and seeks shelter in leaf litter and burrows at night (Smith and Taylor 1966; Macip-Ríos et al. 2013; Ramírez-Bautista et al. 2014). In Mexico, lizards in this complex range along the Pacific ver-

sant from Nayarit to Chiapas and on the Atlantic side from Tamaulipas south through the Yucatan Peninsula to Costa Rica at elevations of 0–800 m asl (Ramírez-Bautista et al. 2014; CONABIO 2019).

Little is known about predators of Rainbow Ameivas, although most are thought to be snakes (Table 1). Pérez-Higareda et al. (2007) reported the predation of *H. undulatus* (= *H. amphigrammus*) in the Tuxtlas region of Veracruz by the Salmon-bellied Racer (*Mastigodryas melanolomus*), the



Fig. 1. A Terciopelo (*Bothrops asper*) (ITSZ-R-S-200) found dead in Cuichapa, Veracruz, México, with a prey item identified as a Rainbow Ameiva (*Holcosus amphigrammus*) (ITSZ-R-L-300). Photograph by Rene Avalos Vela.

Table 1. Documented predators of Rainbow Ameivas, *Holcosus undulatus* (*sensu lato*), in Mexico and Central America. Names of prey species reflect current taxonomy (Meza-Lázaro and Nieto-Montes de Oca 2015; Mesoamerican Herpetology 2020; Uetz et al. 2020). Except for prey identified as *Holcosus gaigeae* or *H. hartwegi*, which were identified as such in the references listed, all other sources had identified lizards as either *Ameiva undulata* or *Holcosus undulatus*. For those records marked with an asterisk (*), we were unable to determine the current taxonomic status of the species because multiple taxa previously assigned to *A. undulata* (= *H. undulatus*) occur in the areas covered by those accounts.

Predator	Prey	Locality	Reference
REPTILIA			
Squamata: Dipsadidae			
Mexican Snake Eater <i>Clelia scytalina</i>	<i>H. amphigrammus</i>	Veracruz, México	Pérez-Higareda et al. (2007)
Common Road Guarder <i>Conophis lineatus</i>	<i>H. gaigeae</i>	Yucatán, México	Gómez de Regil and Escalante-Pasos (2017)
Striped Road Guarder <i>Conophis vittatus</i>	<i>H. sinister</i>	Jalisco, México	Madrid and Cifuentes (2012)
Squamata: Colubridae			
Black-tailed Cribro <i>Drymarchon corais</i>	<i>A. undulata*</i>	—	Campbell (1999)
Guatemalan Milksnake <i>Lampropeltis abnorma</i>	<i>H. gaigeae</i>	Yucatán, México	Carbajal-Márquez et al. (2019)
Atlantic Central American Milksnake <i>Lampropeltis polyzona</i>	<i>H. amphigrammus</i>	Veracruz, México	Pérez-Higareda et al. (2007)
Salmon-bellied Racer <i>Mastigodryas melanolomus</i>	<i>H. amphigrammus</i>	Veracruz, México	Pérez-Higareda et al. (2007)
Neotropical Whipsnake <i>Masticophis mentovarius</i>	<i>A. undulata*</i>	—	Campbell (1999)
Squamata: Elapidae			
Variable Coralsnake <i>Micrurus diastema</i>	<i>H. gaigeae</i>	Yucatán, México	Greene (1973)
Squamata: Viperidae			
Cantil <i>Agkistrodon bilineatus</i>	<i>H. parvus</i>	Guanacaste, Costa Rica	Savage (2002)
Eyelash Viper <i>Bothriechis schlegelii</i>	<i>H. parvus</i>	Guanacaste, Costa Rica	Morgan and Barrio-Amorós (2015)
Terciopelo <i>Bothrops asper</i>	<i>H. amphigrammus</i> <i>H. amphigrammus</i>	Veracruz, México Veracruz, México	Buttenhof and Vogt (1997) This paper
Hog-nosed Pitviper <i>Porthidium nasutum</i>	<i>H. hartwegi</i>	Chiapas, México	Paredes-Montesinos et al. (2015)
Squamata: Xenosauridae			
Knob-scaled Lizard <i>Xenosaurus grandis</i>	<i>H. amphigrammus</i>	Veracruz, México	Ballinger et al. (1995)
AMPHIBIA			
Gymnophiona: Dermophiidae			
Mexican Caecilian <i>Dermophis mexicanus</i>	<i>A. undulata*</i>	Chiapas, México	Moll and Smith (1967)



Fig. 2. A juvenile Rainbow Ameiva (*Holcosus amphigrammus*) encountered at night in Cuichapa, Veracruz, México. Photographs by Rene Avalos Vela.

Atlantic Central American Milksnake (*Lampropeltis polizona*), and the Mexican Snake Eater (*Clelia scytalyna*), although for the latter two species they listed only the genus *Holcosus*, we infer that this was *H. undulatus* (= *H. amphigrammus*) given that it is the only species of the genus that occurs in the region (Smith and Lafe 1945). Campbell (1999) included *H. undulatus* (*sensu lato*) in the diet of the Common Road Guarder (*Conophis lineatus*), but Gómez de Regil and Escalante-Pazos (2017) documented this species preying on *H. gaigeae*. Ballinger et al. (1995) tentatively reported *Ameiva* or *Aspidocelis* ingested by *Xenosaurus grandis*, but we have never observed any species of *Aspidocelis* in Cuautlapan nor were any reported by Cerón de la Luz et al. (2016).

At about noon on 27 December 2019, we observed a dead juvenile Terciopelo (*Bothrops asper*) (Instituto Tecnológico Superior de Zongolica, ITSZ-R-S-200) on the side of a trail in the Municipality of Cuichapa, Veracruz, Mexico (18°46'27.4"N, 96°51'02.6"W). A recent injury behind the head indicated that it had been killed by humans. When we examined the specimen at a later date, we noticed a bulge in its gut, which we dissected to reveal a juvenile *Holcosus amphigrammus* (ITSZ-R-L-300) (Fig. 1).

Buttenhoff and Vogt (1997) described a juvenile Terciopelo from Montepio, Veracruz, that contained an *Ameiva undulata* (= *H. amphigrammus*) in its stomach, and the authors hypothesized that the snake had ambushed its prey due to the implausibility of predation by chase given the speed of the lizard. Furthermore, because *B. asper* is active mainly at night (Wasko and Sasa 2009) and Rainbow Ameivas are diurnal, we believe that the juvenile viperid encountered the lizard while foraging at night. This assumption was reinforced by a nighttime encounter with a juvenile *H. amphigrammus* in nearby Cuichapa (Fig. 2) that was under a log and did not try to escape when exposed. Additionally, the predation event described above almost certainly occurred during the previous night given the modest state of digestion of the prey.

This is the first account of predation by a Terciopelo on a Rainbow Ameiva in this mountainous region of Veracruz and only the second ever, 23 years after the first report by Buttenhoff and Vogt (1997) in the Tuxtla region. These are the only instances of predation by *B. asper* on *H. amphigrammus*, although Sasa et al. (2009) listed *H. festivus* in the diet of this viperid in Costa Rica.

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