

New prey item in the diet of the Pygmy Rattlesnake, *Crotalus ravus* Cope, 1865, in central México

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Predator–prey interactions are fundamental components of ecosystem structure and function, shaping trophic dynamics and energy flow (Morales-Mávila et al., 2002). Dietary studies provide key insights into species' natural history, particularly regarding trophic ecology and feeding interactions (Mociño-Deloya, 2016). Here, we document, for the first time, the consumption of the Mexican Least Shrew, *Cryptotis soricinus* (Merriam, 1895), by the Pygmy Rattlesnake, *Crotalus ravus* (Cope, 1865) in central Mexico, expanding current knowledge of the species' diet in the Trans-Mexican Volcanic Belt. Small mammals constitute an important component of snake diets (Close and Cundall, 2012), particularly in Mexico, where a high proportion of terrestrial mammals are small-bodied (≤ 100 g) (Ceballos and Oliva, 2005). Within Eulipotyphla, the family Soricidae includes shrews among the smallest mammals in the country (Carraway, 2007; Sánchez-Cordero et al., 2014).

Cryptotis soricinus is endemic to the Valley of Mexico, including the State of Mexico, Morelos, and Mexico City, where it occurs in temperate environments between 1250–2350 m elevation in livestock pastures with dense herbaceous cover and pine and pine-oak forests (Choate, 1970; Castro-Arellano, 2005; Burgin et al., 2018; Álvarez-Castañeda, 2024). Several snake species have been reported as predators of this shrew (Whitaker, 1974; Aguilar-López and Pineda, 2013), but, to our knowledge, no previous records exist of *C. soricinus* as prey of *Crotalus ravus* (for a recent overview of prey items see Vásquez-Cruz et al., 2021).

Crotalus ravus is a small venomous rattlesnake endemic to temperate montane regions of the Trans-

Mexican Volcanic Belt (Cisneros-Bernal et al., 2022). It is a generalist predator consuming a broad range of prey, including amphibians, reptiles, birds, and small mammals (Vásquez-Cruz et al., 2021). However, regional variation in its diet remains incompletely documented, highlighting the importance of reporting novel prey items.

On 19 August 2025 at 10:45 h, a rattlesnake was captured by a floriculture worker in a greenhouse in Santa Ana Ixtlahuatzingo, Tenancingo (Fig. 1), State of Mexico, Mexico (18.9757°N, 99.6231°W; WGS84; 2075 m elevation). During handling by a non-specialist, the snake inflicted a self-bite and died after regurgitating a prey item. This event was incidental and not part of a controlled experimental procedure.

Both specimens were transported to the Evolutionary Biology Laboratory at the Faculty of Sciences, Autonomous University of the State of Mexico. High-resolution photographs were taken and archived in the Herpetology Photographic Collection of Autonomous University of the State of Mexico (CFH; records CFH55 and CFH56). No voucher specimens were preserved; however, photographic records are available for verification. Identification was conducted using comparative morphometrics based on calibrated photographs analysed in ImageJ (Schneider et al., 2012), with scale references included in each image, and verified using digital callipers.

The prey item was identified as an adult female *Cryptotis soricinus* (Fig. 2) based on external morphology (elongated snout, short bicoloured tail, inconspicuous ears), measurements, and geographic distribution. Measurements were head–body length 58 mm, tail length 38 mm, head length (condylobasal) 18 mm, hind foot length 11 mm, and body mass 8 g, consistent with reported ranges (Choate, 1970; Castro-Arellano, 2005; Carraway, 2007; Woodman, 2018).

The predator was identified as a juvenile *Crotalus ravus* (Fig. 3) based on diagnostic morphological characters, including the absence of a postocular stripe

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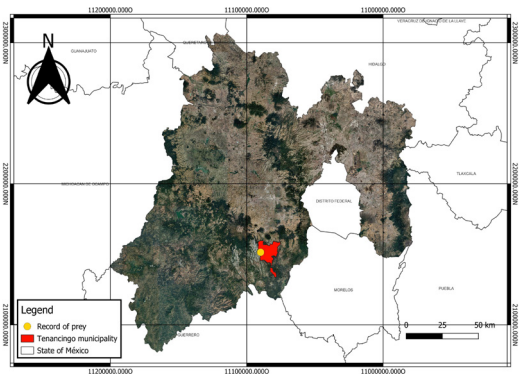


Figure 1. Location of the predation record of *Cryptotis soricinus* by *Crotalus ravus* in Santa Ana Ixtlahuatzingo, municipality of Tenancingo, State of Mexico, Mexico. Elaborated by Irving Rojas-Velasco.

and the presence of nine symmetrically arranged head scales (Campbell and Lamar, 2004). Measurements were snout–vent length 258.7 mm, tail length 21.8 mm, head width 13.6 mm, head length 17.8 mm, and body mass 15 g, consistent with juvenile individuals.

The prey represented more than 50% of the predator’s body mass (8 g vs. 15 g), placing it at the upper range expected for juvenile snakes. Predators typically consume prey smaller relative to their body size to reduce handling time and exposure to risk (Cohen et al., 1993; Cooper Jr. and Stankowich, 2010). However, larger prey items may provide greater energetic returns while increasing physiological and ecological constraints (Kornilev et al., 2023). In some cases, large prey relative to predator size may result in stress-induced regurgitation under disturbance conditions, as observed

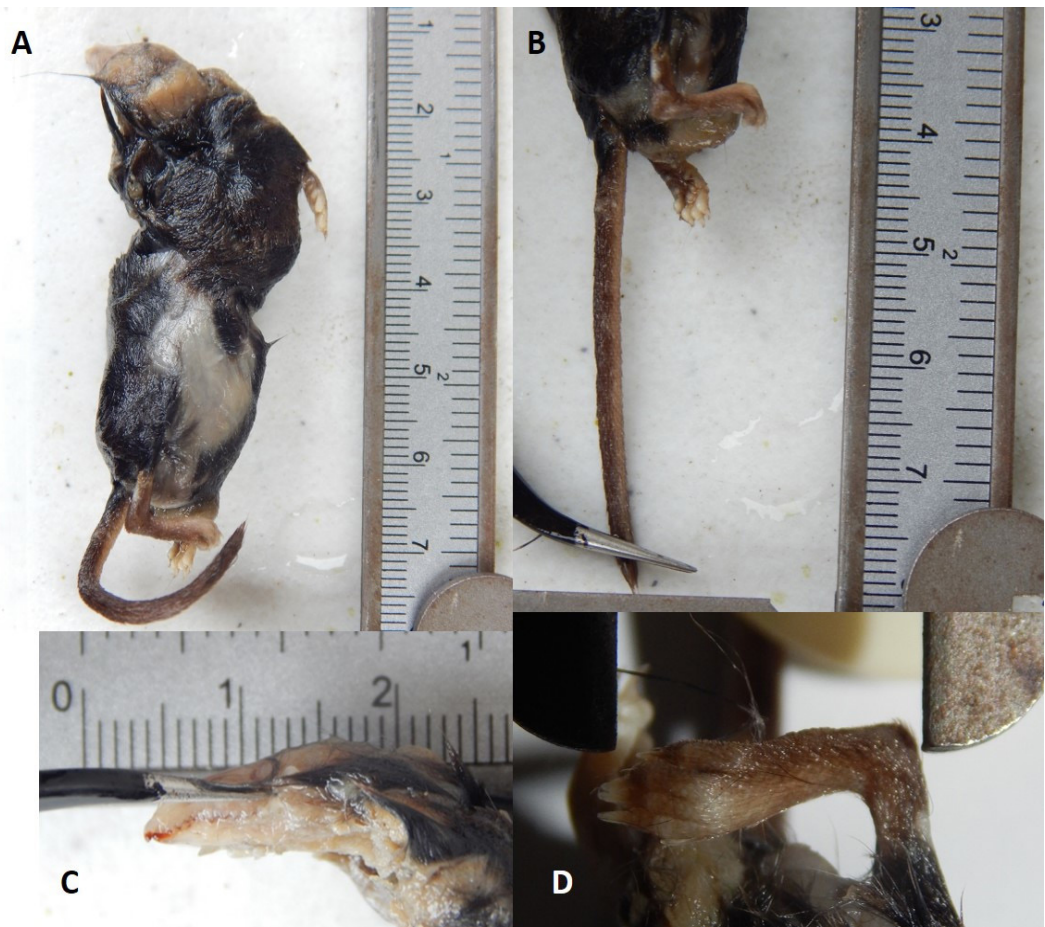


Figure 2. Adult female least shrew, *Cryptotis soricinus*, regurgitated by *Crotalus ravus*. (A) Head–Body length; (B) tail length; (C) head length; (D) hind foot length. Photo by Iván Martínez Vaca-León.



Figure 3. Juvenile *Crotalus ravus* (CFH55). (A) Ventral view; (B) dorsal view and (C) relative size comparison between juvenile *Crotalus ravus* (CFH56) and its prey, *Cryptotis soricinus*. Photo by Iván Martínez Vaca-León.

here (Kumar, 2025). The prey was regurgitated tail-first, indicating ingestion head-first. This pattern is common in snakes and facilitates swallowing by aligning appendages and fur with the direction of ingestion,

thereby reducing handling time (Loop and Bailey, 1972; Brown et al., 2003).

This record represents the first documented instance of *Cryptotis soricinus* as prey of *Crotalus rarus*, contributing to the understanding of the trophic ecology and natural history of this species. The relatively large prey size (Fig. 3C), exceeding 50% of the predator's body mass, suggests potential physiological constraints, particularly in juvenile individuals. This finding expands the known diet of *C. rarus* in the Trans-Mexican Volcanic Belt and highlights the importance of documenting opportunistic feeding events (Morales-Mávil et al., 2002). The importance of this rattlesnake species is also highlighted, given that it is officially classified as "Threatened" in Mexico under the national standard NOM-059-SEMARNAT-2010. Since the predation event occurred in an agricultural area (greenhouse), emphasising this national status is particularly relevant; local populations face significant pressures within their restricted mountainous habitat due to agricultural and urban expansion, even though the species is currently classified globally as "Least Concern" (LC) by the International Union for Conservation of Nature.

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