

First record of predation of the lizard rainbow ameiva (*Holcosus gaigae*) by a jaguarundi (*Puma yagouaroundi*)

Primer registro de depredación de la lagartija ameiva arcoíris (*Holcosus gaigae*) por un jaguarundi (*Puma yagouaroundi*)

JONATHAN PÉREZ-FLORES^{1,2*}, HUMBERTO BAHENA-BASAVE², ANTHONY ANAYA-CONSTANTINO², HOLGER WEISSENBERGER² AND JAVIER CARBALLAR-OSORIO³

¹Secretaría de Ciencia, Humanidades, Tecnología e Innovación (SECIHTI), Av. Insurgentes Sur 1582, CP 03940 Ciudad de México, Ciudad de México, México. E-mail: johnsp77@gmail.com (JP-F).

²El Colegio de La Frontera Sur (ECOSUR), Unidad de Chetumal, Avenida Centenario Km 5.5, CP 77014 Chetumal, Quintana Roo, México. E-mail: hbahena@ecosur.mx (HB-B); anthonynexa@gmail.com (AA-C); holgerweissen@ecosur.mx (H-W).

³Instituto de Biodiversidad y Áreas Naturales Protegidas del Estado de Quintana Roo, Calle Hidroeléctrica de Malpaso 398, Campestre, CP 77030 Chetumal, Quintana Roo, México.

javieronca@gmail.com (JC-O)

*Corresponding author

To date, there have been few studies on the dietary composition of the jaguarundi (*Puma yagouaroundi*). Previous studies mention that reptiles constitute a relatively minor component of the jaguarundi's diet, and in most cases, they are only identified to the family level due to the high degree of degradation of the remains observed in feces or stomach contents. However, in this paper we report the discovery of the remains of two specimens of the rainbow ameiva (*Holcosus gaigae*) in the stomach contents of a jaguarundi that was roadkill in the south of the state of Quintana Roo, Mexico. Identification was made possible due to the good state of preservation of the remains and the size and scale pattern of the forelimbs, which could be compared with specimens from the Herpetological Collection of the Zoology Museum of El Colegio de la Frontera Sur, Unidad Chetumal. These findings are significant in that they facilitate a deeper understanding of the trophic relationships that exist between the diverse species of the Selva Maya.

Keywords: Diet; feline; lizard; Selva Maya; trophic relationship.

Hasta la fecha, los estudios sobre la composición de la dieta del jaguarundi (*Puma yagouaroundi*) han sido escasos. En estudios previos se menciona que los reptiles son uno de los componentes menos frecuentes de la dieta del jaguarundi, y en la mayoría de los casos solamente son identificados hasta el nivel de familia debido al alto grado de degradación de los restos encontrados en las heces o en los contenidos estomacales. Sin embargo, en este manuscrito reportamos el hallazgo de los restos de dos ejemplares de ameiva arcoíris (*Holcosus gaigae*) en el contenido estomacal de un jaguarundi atropellado en el sur del estado de Quintana Roo, México. La identificación fue posible gracias al buen estado de conservación de los restos y al tamaño y patrón de escamas de los miembros anteriores, que pudieron ser comparados con ejemplares de la Colección Herpetológica del Museo de Zoología de El Colegio de la Frontera Sur, Unidad Chetumal. Estos hallazgos son significativos en la medida en que facilitan una comprensión más profunda de las relaciones tróficas que existen entre las diversas especies de la Selva Maya.

Palabras clave: Dieta; felino; lagartija; relación trófica; Selva Maya.

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The Yucatan Peninsula hosts five of Mexico's six wild cat species: jaguar (*Panthera onca*), puma (*Puma concolor*), ocelot (*Leopardus pardalis*), margay (*Leopardus wiedii*) and jaguarundi (*Puma yagouaroundi*) ([Clavijo and Ramírez 2009](#)). The latter is likely the least researched of these species. The jaguarundi is listed in the Norma Oficial Mexicana NOM-059-SEMARNAT-2010 ([SEMARNAT 2010](#)) as a threatened species and is classified as least concern by the International Union for Conservation of Nature ([IUCN; Caso et al. 2015](#)). This feline species is distributed over a broad range, extending from the US-Mexico border to southern Argentina ([de Oliveira 1998](#)), and due to the adaptability of this feline species, it inhabits a diverse array of habitats, including savannah, scrub, tropical rainforest, deciduous

forest, dense chaparral, thickets and potentially agricultural areas ([Giordano 2016; Harmsen et al. 2024](#)).

The jaguarundi is a small felid, measuring between 60 and 100 cm in length and weighing between 4 and 9 kg. The elongated body and tail, coupled with the relatively short legs in relation to the body, are distinctive features of this species. In terms of size, females are smaller than males ([de Oliveira 1998](#)). The jaguarundi exhibits three color morphs: chocolate brown (the most common), greyish silver and reddish brown (less common; [Giordano 2016](#)). It has been proposed that the morphology and pelage of this species may provide a competitive edge over other mesocarnivores, as it favors habitats devoid of arboreal vegetation, including grasslands, savannahs, scrublands,

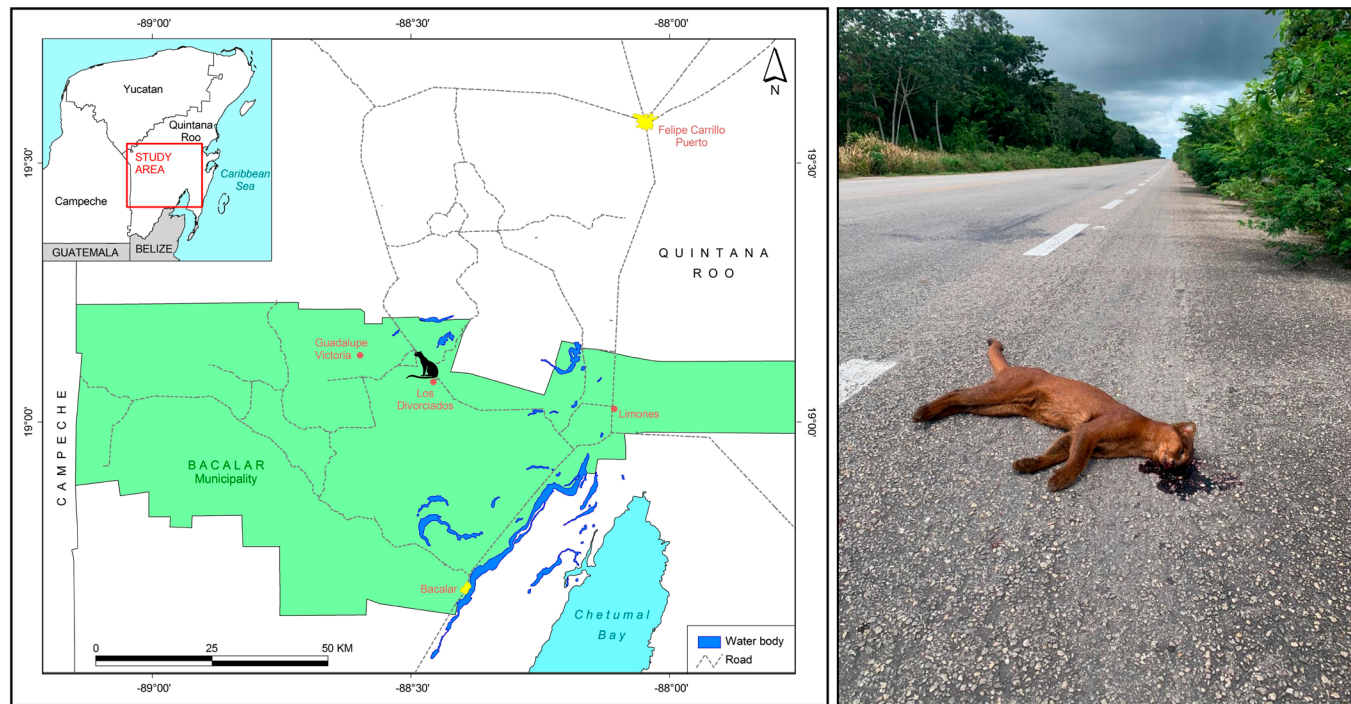


Figure 1. Location of the road-killed jaguarundi, *Puma yagouaroundi* near the community (ejido) Los Divorciados (image of the jaguarundi) in the municipality of Bacalar, Quintana Roo, Mexico.

and agricultural areas (Harmsen *et al.* 2024), where it is more likely to encounter its primary prey (Giordano 2016).

In contrast to other small wildcats in southeastern Mexico, the jaguarundi exhibits a diurnal activity pattern (Konecny 1989) and extensive home ranges, with females occupying areas up to 20 km² and males up to 100 km² (Konecny 1989). The diet of jaguarundi is influenced by these traits, comprising a variety of species including birds, mammals, reptiles, invertebrates, plant matter and fish (de Oliveira 1998; Rocha-Mendes *et al.* 2010; Bianchi *et al.* 2011; Gómez-Ortiz *et al.* 2015; Giordano 2016; Alanis-Hernández *et al.* 2024). It is therefore crucial to accurately identify the species preyed upon by the jaguarundi, as this will assist in the understanding of interspecific trophic relationships and in developing conservation strategies that will help protect both prey and predator. Therefore, our aim is to report the predation of two rainbow ameivas (*Holcosus gaigeae*) by a jaguarundi in Quintana Roo, Mexico.

The rainbow ameiva is a medium-sized terrestrial lizard (length of the snout to cloaca 80-130 mm) with a robust body and short muscular limbs (Ramírez-Bautista 1977). These lizards feed mainly on insects, other small lizards and eggs (Schwartz and Henderson 1991; Meza-Lázaro 2015). They are active foragers during the day and seek shelter in leaf litter and burrows at night (Macip-Ríos *et al.* 2013; Ramírez-Bautista *et al.* 2014). This species is not listed in the Norma Oficial Mexicana NOM-059-SEMARNAT-2010 and has not been assessed by the International Union for Conservation of Nature (IUCN).

In Mexico, rainbow ameivas have several predators including spiders (genus: *Lycosa*), snakes (genera: *Clelia*, *Conophis*, *Drymarchon*, *Lampropeltis*, *Mastigodryas*, *Masticophis*,

Micrurus, *Agkistrodon*, *Bothriechis*, *Bothrops*, *Porthidium*), lizards (genus: *Xenosaurus*), amphibians (genus: *Dermophis*), birds of prey (genus: *Buteo*), and the domestic cat (*Felis catus*), the only previously documented mammal predator in Mexico (see in detail Meza-Lázaro and Nieto-Montes de Oca 2015; Nahuat-Cervera *et al.* 2020; Nahuat-Cervera and Pérez-Martínez 2021). Accordingly, we propose that our finding would be the first record of a wild mammal in Mexico preying on a rainbow ameiva.

On September 16, 2024, a reddish-brown adult male was found roadkilled on Federal Highway 293 (known as Vía Corta Mérida-Chetumal) in the south of the state of Quintana Roo, Mexico. The incident occurred 2.2 km north from the community (ejido) Los Divorciados (19° 05' 51.7" N, 88° 27' 30.1" W) in the municipality of Bacalar (Figure 1). The animal had been deceased for only a few hours, hence exhibiting no autolytic alterations. The jaguarundi was retrieved, refrigerated by the environmental authorities (Instituto de Biodiversidad y Áreas Naturales Protegidas del Estado de Quintana Roo [IBANQROO] and Procuraduría Federal de Protección al Ambiente [PROFEPA]), and later conveyed to the laboratory of El Colegio de la Frontera Sur, Unidad Chetumal, for necropsy the following day.

The necropsy was conducted with meticulous care and precision. Upon examining the gastric contents, we noted the presence of bones, four forelimbs, and the remnants of the hind limb digits of an unnamed lizard species that had not yet been fully digested (Figure 2a). The remains were subsequently washed with distilled water and preserved in 96% alcohol for later identification. Once fixed in alcohol, the four forelimbs and several toes of the hind limbs were subject to analysis as they exhibited the least damage.



Figure 2. Stomach contents of a road-killed jaguarundi (*Puma yagouaroundi*): a) Remains of bones, forelimbs and hindlimbs of a rainbow ameiva (*Holcosus gaigae*); b) Comparison of the found remains with one of the specimens of the Herpetological Collection of the Zoology Museum of El Colegio de la Frontera Sur, Unidad Chetumal.

The number of forelimbs found (4) suggests that the jaguarundi preyed on two individuals of the same species. The scale pattern, shape and length of the digits were compared between three species of lizards inhabiting the region that may have been similar in size at some stage in their life cycle: the brown basilisk (*Basiliscus vittatus*), the Yucatan whiptail (*Aspidoscelis angusticeps*) and the rainbow ameiva (Figure 3). All these specimens belong to the Herpetological Collection of the Zoological Museum (ECO-CH-H), Unidad Chetumal. The dorsal and ventral forelimb scale patterns and toe shape (forelimb and hindlimb) were identical to those of the rainbow ameiva (Figure 2b).

We hypothesise that predation on these reptiles may have occurred due to the diurnal activity patterns of both species, which may have resulted in more frequent encounters. During the day, ameivas leave from their shelters to bask in the sun (to absorb heat and maintain their optimal body temperature; Vitt and Caldwell 2013), which would expose them to predation. Ameivas are more prevalent in ecosystems that are subject to moderate human disturbance (Macip-Ríos et al. 2013), habitats in which the jaguarundi is well adapted (Coronado-Quibrera et al. 2019). Consequently, predatory interactions between both species may be more frequent than previously thought. Furthermore, the discovery of the remains of two ameivas indicates that if they were a female and a male (some ameivas reproduce during the rainy season; Savage 2002), these individuals were engaged in either courtship or mating behavior, or alternatively, if they were both males, in a territorial dispute.

Recent reviews of jaguarundi dietary components have documented that reptiles are a relatively minor component of their diet (9-12%) compared to mammals (59%), invertebrates (21-27%), birds (7-11%), plants and fruits (6%) and fish (1%) (Giordano 2016; Alanis-Hernández et al. 2024). In Venezuela, lizards can represent up to 35% of the diet of the jaguarundi (de Oliveira 1998), while in Mexico the only study reports 0.89% (Guerrero et al. 2002). Among the main reptiles that make up the jaguarundi's diet are lizards (diplogossids, iguanids, phrynosomatids, theiids and tropidurids) and several species of snakes (colubrids, viperids; Giordano 2016; Alanis-Hernández et al. 2024). Our findings are significant, as in the Selva Maya and several other regions of Mexico where the jaguarundi is present, there is no information related to the composition of their diet. It is our hope that this note will serve to encourage further studies on the diet and feeding habits of the small wild felids of southeastern Mexico (margay, ocelot and jaguarundi), given that past and current conservation efforts appear to focus exclusively on the jaguar, without sufficient consideration of the differing conservation strategies that may be required for these other feline species and their prey.

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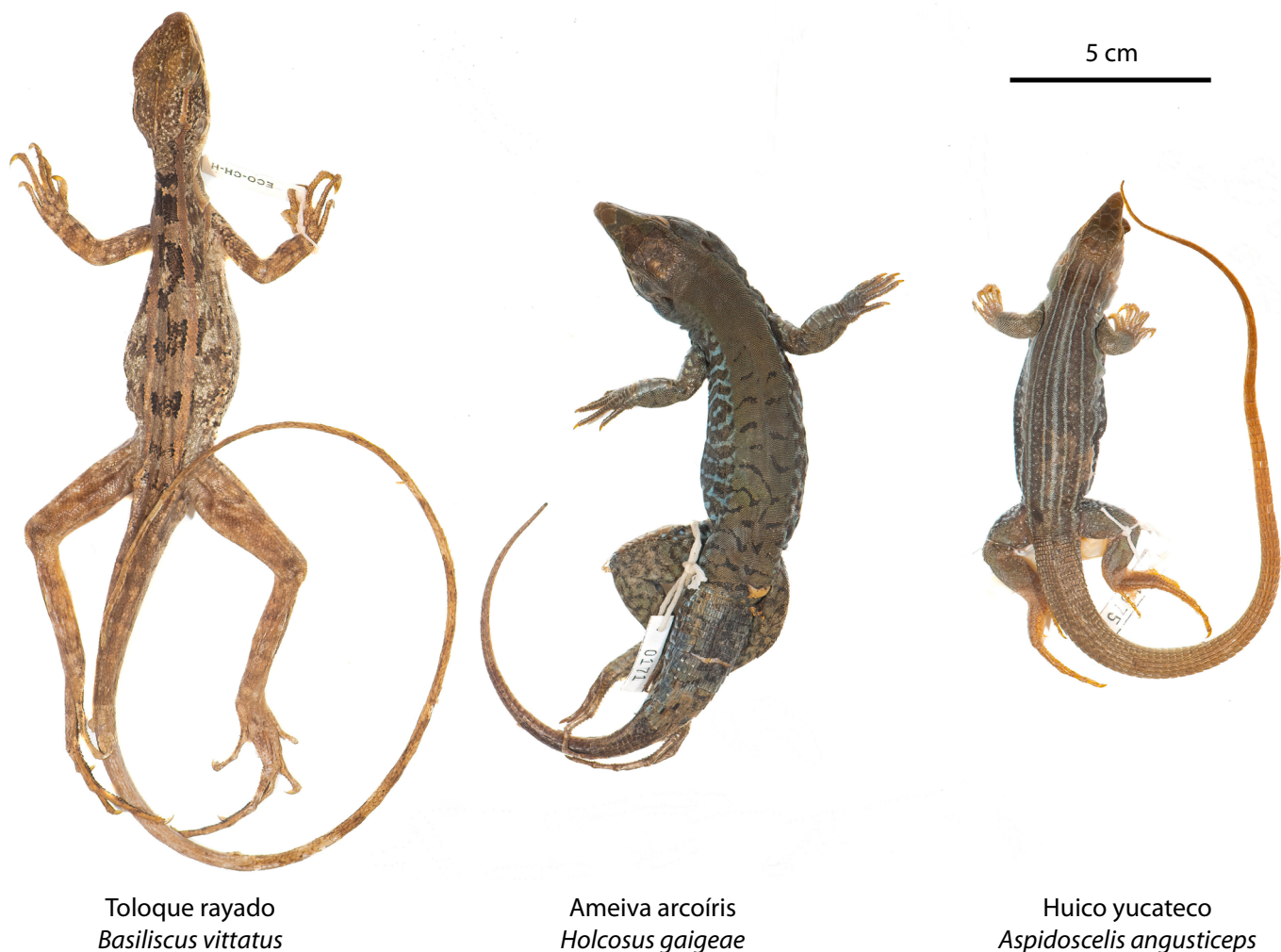


Figure 3. The three species of lizards inhabiting southern Quintana Roo, Mexico, that were compared to identify the remains of rainbow ameiva (*Holcosus gaigeae*).

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