

# Geographic distribution of tropical cacomixtle (*Bassariscus sumichrasti*) in Puebla, México

## Distribución geográfica del cacomixtle tropical (*Bassariscus sumichrasti*) en Puebla, México

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The tropical cacomixtle (*Bassariscus sumichrasti*) a rare neotropical carnivore with a geographic distribution restricted to the southern tropical part of the México and Central America. There have been 2 records of this species in the state of Puebla, specifically in the vicinity of Tehuiztzingo and Acatlán. During a routine assessment of the Mammal Collection at the Universidad Autónoma Metropolitana, we found a specimen with the characteristics of *B. sumichrasti*. The specimen was collected near Zacapala, in the southwestern extreme of Puebla in a tropical deciduous forest. Our specimen along with previous records of *B. sumichrasti* in Puebla, are concentrated in the northern part of the Balsas Basin, where sympatry with *B. astutus* is possible. Given the limited available information on the species, this new specimen is a valuable addition to the knowledge of the distribution that can contribute to a better understanding of the species.

**Key words:** Carnivore; distribution; procyonid; Puebla; tropical cacomixtle.

El cacomixtle tropical (*Bassariscus sumichrasti*) es un carnívoro neotropical raro con una distribución geográfica restringida a la parte tropical sur de México y Centroamérica. En Puebla esta especie se ha registrado en 2 ocasiones, específicamente en las cercanías de Tehuiztzingo y Acatlán. Durante una revisión cotidiana de la Colección de Mamíferos de la Universidad Autónoma Metropolitana encontramos un ejemplar con las características de *B. sumichrasti*. El ejemplar fue colectado cerca de Zacapala, en el extremo suroeste de Puebla en una selva tropical caducifolia. Nuestro espécimen junto con los registros anteriores de *B. sumichrasti* en Puebla, se encuentran en la parte norte de la Cuenca del Balsas, donde es posible la simpatria con *B. astutus*. Dada la limitada información disponible sobre la especie, este nuevo espécimen es una valiosa adición al conocimiento de la distribución que puede contribuir a una mejor comprensión de la especie.

**Palabras clave:** Cacomixtle tropical; carnívoro; distribución, prociónimo; Puebla.

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The tropical cacomixtle (*Bassariscus sumichrasti*) is a rare neotropical carnivore species, characterized by specific morphological features. It has a long, slender body with a total length ranging from 790 to 1,003 mm (Goodwin 1969). The tail is generally longer than its head and body, measuring between 396 to 508 mm, and displays alternating bands of black and light buff (Goodwin 1969; Hall 1981). Although it shares a general resemblance with northern cacomixtle (*B. astutus*), it can be distinguished by certain characteristics, including nearly indistinct tail rings toward the distal end, and finer, soft and laxer fur. This species also has long, curved, compressed, and non-retractable claws, and the second and third digits of both the forelimbs and hindlimbs lack fur on the undersurface behind the digital pads. In addition, the skull of *B. sumichrasti* exhibits connected lower ridges on its molariform teeth, and its upper carnassial tooth is triangular without a deuterocone (Nelson and Goldman 1932; Goodwin 1969; Hall 1981).

The tropical cacomixtle is known for its nocturnal, solitary, and arboreal habits, although it can descend to the ground when necessary (Emmons and Feer 1990; Nava 2005; Aranda 2012). Its diet, although not extensively studied is believed to consist of a variety items, including fruits, insects, and small vertebrates (Aranda 1981; Emmons and Feer 1990; Nava 2005). Unlike its sister species, *B. astutus*, the tropical cacomixtle is primarily observed in tropical and subtropical forests, as well as mountain cloud forests (Nava 2005; Emmons and Feer 1990).

Despite its rarity and scarcity of records, the *B. sumichrasti* is not considered to face significant conservation problems. It falls under the "least concern" category according to the International Union for Conservation of Nature (IUCN; Pino *et al.* 2020) and it is listed in Appendix III by the Convention on International Trade in Endangered Species of Wildlife and Flora (CITES 2014); while

in México, it is considered subject to special protection (SEMARNAT 2018).

The distribution of *B. sumichrasti* extends from south-eastern México to Panamá (Hall 1981), including countries such as Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua, and Panamá. In México, its range covers the Yucatán Península, southern Campeche, Quintana Roo, and western Yucatán, along with most of Chiapas and Oaxaca. It extends as far north as central Veracruz along the Gulf of México and south to Guerrero along the Pacific coast (Hall 1981; Emmons and Feer 1990; Wozencraft 2005; Pino et al. 2020).

However, records and the distribution of *B. sumichrasti* in the state of Puebla have been somewhat confusing. The first specimen recorded in Puebla is attributed to López-Wilchis and López Jardínez (1999) corresponding to a specimen from the Moore Mastozoological Collection Laboratory of Zoology collected in Rancho Papayo, 10 mi S Tehue[it]zingo, Puebla, in July 1943 (<http://vertnet.org/>). It is on the basis of this record, further publications referring to the species occurring in Puebla include Ramírez-Pulido et al. (2000); Martínez-Vázquez et al. (2011); Ramírez-Bravo and Hernández-Santín (2016). There is another record from “La Azuchilera”, in the Municipality of Acatlán (Villarreal-Eb et al. 2012), which features a skull photograph. However, it exhibited characteristics more consistent with *B. astutus* than with *B. sumichrasti*, including well-marked temporal ridges and a deuterococone on the upper carnassial tooth, with cranial measurements aligning more with *B. astutus* (Goodwin 1956, 1969; Davis and Lukens 1958; Hall 1981; Poglajen-Neuwall and Towell 1988). Thus, the specimen requires further examination to clarify its identification.

A recent discovery in the Mammal Collection of the Universidad Autónoma Metropolitana (UAMI) revealed a specimen from Puebla, which exhibited all the external characteristics of *B. sumichrasti*. Locality and the collecting date reported here were taken directly from the specimen tags. Habitat, and vegetation type data were obtained from the collector's field notes, and some data on its biology were taken from the preparation diary. The *B. sumichrasti* specimen was compared with other specimens of *B. astutus* (Figure 1). All specimens, preparation diary, collector's field notes are found in the same collection of mammals.

The specimen was collected 3 km from Zacapala, Puebla, on January 13, 1989 (UAMI 17277). This specimen does not have the skull and the skin does not have the legs and the end of the tail. Although the skull was not available for examination, notable features such as the tetracolor dorsal hair, with pelage long and soft, while the dorsal hair of *B. astutus* is tricolor, with pelage comparatively short and coarse. The hair on the cheek is light cream, and short and rounded ears, with the dorsal part of the ear covered with longer and more abundant hair, while in *B. astutus* has more darker cheeks, the ears are slightly larger and comparatively more pointed, with the short and less abundant

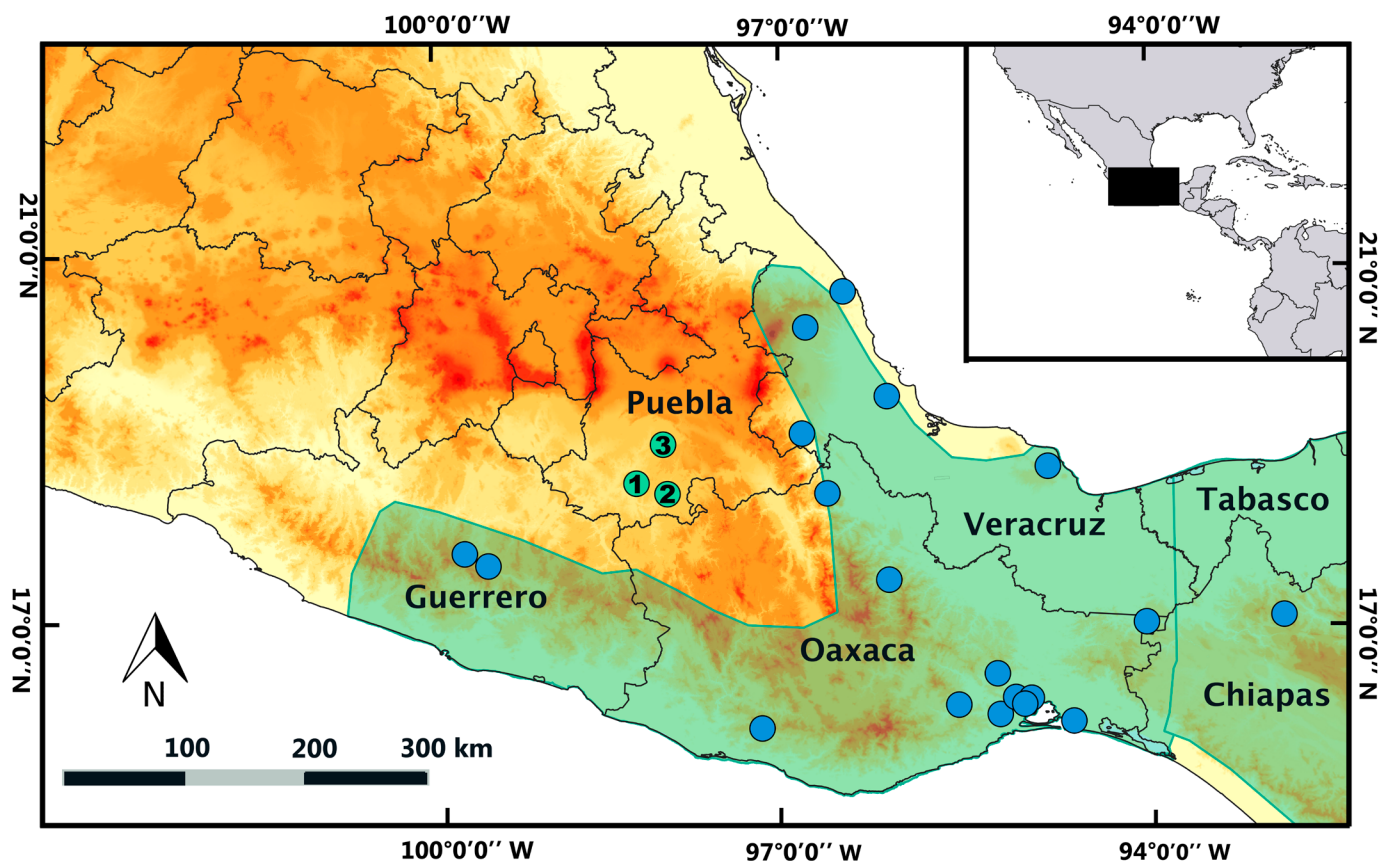
hair. Despite the absence of the skull these features provide sufficient evidence to consider this specimen a clear representative of *B. sumichrasti*.

The records of *B. sumichrasti* in Puebla, including those of Tehuitzingo (López-Wilchis and López Jardínez 1999; Ramírez-Bravo and Hernández-Santín 2016), Acatlán (Villarreal-Eb et al. 2012), and the latest finding near Zacapala, are concentrated in the northern part of the Balsas Basin (Figure 2). The atypical characteristics of this region, including higher elevations not typically associated with the species and the presence of deciduous forests rather than the typical tropical forest and mountain cloud forests where *B. sumichrasti* is usually found (Emmons and Feer 1990; Nava 2005), raise questions about this population unique nature.

It is speculated that the species may have entered the Balsas Basin region from localities in the southern part of Oaxaca, belonging to *B. s. sumichrasti*, although not from Guerrero, which corresponds to *B. s. latrans*. Additionally, *B. sumichrasti* was found in the mountain cloud forests in the center of Veracruz (Jalapa [Xalapa]; Hall and Dalquest 1963; Hall 1981) and the similarity of certain regions in the Sierra Norte de Puebla to Jalapa, Veracruz suggests a potential distribution in these areas. It is also possible that the tropical cacomixtle can be found in the extreme southeast of Puebla in tropical rain forest in the Zacacoapan region because there are localities with records of *B. sumichrasti* that are very close in Oaxaca and Veracruz (Hall and Dalquest 1963; Goodwin 1969; Figure 2). The 3 records of *B. sumichrasti* in Puebla are no more than 10 km apart together, but they are separated by more than 190 km from the nearest locality in Jalapa, Veracruz.



**Figure 1.** Comparisons of skin of *Bassariscus sumichrasti* and *B. astutus* from Puebla, México. From left to right *B. astutus* (534 UAMI; 535 UAMI; 536 UAMI), and *B. sumichrasti* (17277 UAMI).



**Figure 2.** Geographic distribution of *Bassariscus sumichrasti* in México according by the International Union for Conservation of Nature (green area; Pino et al. 2020). The records (blue dots) correspond to Oaxaca and Guerrero (Goodwin 1969; Hall 1981; Cervantes and Yépez Mulia 1995; Lira-Torres et al. 2012), Veracruz (Hall and Dalquest 1963; Hall 1981; González Christen 2008; Astiazarán Azcárraga et al. 2020; Mezhuva-Velázquez et al. 2022), Guerrero (Davis and Lukens 1958; Hall 1981). The localities of Puebla correspond to 1) Tehuiztingo (López-Wilchis and López Jardínez 1999; Ramírez-Bravo and Hernández-Santín 2016), 2) Acatlán (Villarreal-Eb et al. 2012), and 3) Zacapala (in this work).

The records from Puebla indicate that *B. sumichrasti* is sympatric with *B. astutus* in the southern part of Puebla in the Balsas Basin. While the 2 species may coexist in this region, it is unclear whether they are truly syntopic, meaning they occupy the same region with an abundance of resources that can sustain both species. Further research and observations are needed to better understand the distribution, behavior, and ecological interactions of these 2 species in sympatric areas.

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