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The Yucatán mouse opossum (*Tlacuatzin gaumeri*) in Quintana Roo, México

El tlacuache ratón de Yucatán (*Tlacuatzin gaumeri*) en Quintana Roo, México

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The Yucatán mouse opossum (*Tlacuatzin gaumeri*) is a little-known species so far reported only from the Mexican states of Campeche and Yucatán in the Yucatán Península. Due to the geographic proximity of these states to the state of Quintana Roo and their similar climate and vegetation, the presence of this marsupial in Quintana Roo would be expected. Scientific literature, curatorial records of scientific collections in México, in the GBIF, and observations of the citizen science portal iNaturalistMX were consulted. The curatorial records and one field observation were ordered in a table and a map was elaborated with QGIS 3.36.2. Curatorial records of the scientific collection of *T. gaumeri* were found in the Mexican state of Quintana Roo. Similarly, one citizen science observation (research grade) was found for Quintana Roo, near the western portion of the Sian Ka'an Biosphere Reserve. The records extend the known geographic distribution of *T. gaumeri* 139 km (average) eastward from the Yucatán Península. The data record *T. gaumeri* for the first time in Quintana Roo and confirm its endemicity in that state; they also extend the known geographic distribution of this marsupial. Although its presence coincides with only one natural protected area, it may contribute to its conservation. It still needs to be determined if it applies to any risk category, but the results contribute to the faunal inventory of the Yucatán Península.

Key words: Citizen science; Didelphidae; Didelphimorphia; dry tropical forest; museum specimen; new record.

El tlacuache ratón de Yucatán (*Tlacuatzin gaumeri*) es una especie poco conocida hasta ahora, reportada solamente de los estados mexicanos de Campeche y Yucatán en la Península de Yucatán. En virtud de la vecindad geográfica de estas entidades con el estado de Quintana Roo y por su similitud climática y de vegetación, se esperaría la presencia de este marsupial en territorio quintanarroense. Se consultaron la literatura científica, los registros curatoriales de colecciones científicas en México, en el GBIF y las observaciones del portal de ciencia ciudadana iNaturalistMX. Los registros curatoriales y una observación de campo se ordenaron en una tabla y se elaboró un mapa con QGIS 3.36.2. Se encontraron registros curatoriales de colección científica de *T. gaumeri* para el estado mexicano de Quintana Roo. Similarmente, se encontró una observación (grado investigación) de ciencia ciudadana para Quintana Roo, cerca de la porción occidental de la Reserva de la Biosfera de Sian Ka'an. Los registros amplían la distribución geográfica conocida de *T. gaumeri* 139 km (en promedio) hacia el este de la Península Yucateca. Los datos registran por primera vez a *T. gaumeri* en Quintana Roo y confirman su endemicidad en ese estado; asimismo amplían la distribución geográfica conocida de este marsupial. Aunque su presencia coincide solo con un área natural protegida, puede contribuir a su conservación. Se requiere todavía determinar si aplica para alguna categoría de riesgo, pero los resultados contribuyen al inventario faunístico de la Península Yucateca.

Palabras clave: Bosque tropical seco; ciencia ciudadana; Didelphidae; Didelphimorphia; ejemplar voucher; nuevo registro.

Mexican tlacuaches are marsupial mammals (Order Didelphimorphia) in the family Didelphidae. They are taxonomically grouped into 12 species in the genera *Didelphis* (2), *Philander* (1), *Caluromys* (1), *Metachirus* (1), *Chironectes* (1), *Marmosa* (1) and *Tlacuatzin* (5) (Arcangeli *et al.* 2018; Burgin *et al.* 2018). In contrast to the medium body size of most of their specimens, species of the latter 2 genera are small in size and because of their appearance are commonly mistaken for mice (Gaumer 1917). Species such as *Marmosa mexicana* have a wide geographic distribution in México and therefore are somewhat better known to the scientific community (Mejía and Medellín 1992). However, other species are poorly known, reflected in their scarce or null mentions in the scientific literature and the scarce collection of their morphological evidence documenting biodiversity in scientific collections.

Such is the case of the Yucatán mouse opossum (*Tlacuatzin gaumeri*), also known as tlacuachín, tlacuache ratón yucateco (Álvarez-Castañeda and González-Ruiz 2018) and holioch (Mayan word; Gaumer 1917), a species endemic to the Yucatán Península, México (Arcangeli *et al.* 2018). Known until recently as *T. canescens* (Martin 2017), *T. gaumeri* has been little studied and is therefore poorly known, despite its remarkable ecological and evolutionary relevance and its neotropical affinity (Voss and Jansa 2003). The Mexican government does not consider this

small tlacuachín in any risk category (Secretaría de Medio Ambiente y Recursos Naturales; SEMARNAT 2010), nor does the IUCN Red List (IUCN 2024).

Detailed research by González Christen and Rodríguez Santiago (2014) reported that *T. canescens gaumeri* inhabits the states of Campeche and Yucatán, but not Quintana Roo; the extensive report by Sosa-Escalante *et al.* (2013) on the terrestrial mammals of Yucatán also agrees with this result. However, since the 3 states of the Yucatán Península share similar vegetation types and climatic patterns, it is to be expected that *T. gaumeri* also occurs in the territory of Quintana Roo.

Most of the surface area of Yucatán, and to a lesser extent in Campeche and Quintana Roo, is covered by low deciduous forests (CICY 2010). Between the low deciduous forest and the high evergreen forest, there are intermediate associations known as medium forest, which can be deciduous or sub-evergreen. In general, the height and physiognomy are intermediate between one and the other and also in terms of spatial distribution, occupying an intermediate strip between the dry extreme north of the Península and the humid extreme, to the south (CICY 2010; Flores Guido *et al.* 2010).

It is also known that the presence of *T. c. gaumeri* in much of its range is associated with dry and sub-humid forests, including in the Yucatán Península (Gaumer 1917; Hernández-Cardona *et al.* 2007; Sosa-Escalante *et al.* 2013). Complementing this information are several citizen science contributions that provide interesting images of *T. c. gaumeri* (iNaturalistMX 2024) in geographic areas of the Yucatán Península that correspond to different tropical forests.

Therefore, the purpose of this study was to corroborate or refute the existence of records of the occurrence of *T. gaumeri* in Quintana Roo in scientific collections and in one of México's citizen science platforms that include research-grade records.

We searched curatorial records of the presence of *T. gaumeri* in the GBIF (Global Biodiversity Information Facility 2024) web portal for non-Mexican mammal collections. In addition, we requested information directly from the curators of the following Mexican scientific collections identified by the acronyms recognized in the Directory of Western Hemisphere mammal collections (Dunnum *et al.* 2018): CM-UAC, UADY, ECO-SC-M, MZ-ICACH, ENCB, UAMI, MZFC-M, and CNMA. At the same time, with the same purpose, we consulted the research-grade observations reported in the iNaturalistMX platform (https://mexico.inaturalist.org/). iNaturalistMX shares "Research Grade" licensed observations with a range of data partners for use in science and conservation, where the quality grade summarizes the location accuracy, completeness, relevance, and suitability of an iNaturalistMX observation as biodiversity data. Emphasis was given to the information from the state of Quintana Roo.

We also confirmed the taxonomic identity and curatorial data of the specimens with the curator of the corresponding mammal collection. We verified the nomenclature and classification of the specimens according to the current update 2024 (ASM 2024) of the publication of Burgin *et al.* (2018). The geographic position of the records found was illustrated on a map produced with QGIS 3.36.2 software (QGIS 2024).

We found 4 curatorial records of *T. gaumeri* for the Mexican state of Quintana Roo in the Colección Mastozoológica de El Colegio de la Frontera Sur (ECO-SC-M; San Cristóbal de Las Casas, Chiapas; Table 1). According to the geographic position of their collection localities and the contribution of Ek Díaz (2011) on the vegetation of Quintana Roo, specimens ECO-SC-M 5479, 5480, and 5670, were collected in medium sub evergreen forest (selva mediana subperennifolia), while specimen ECO-SC-M 6119 was captured in low thorny sub evergreen forest (selva baja espinosa subperennifolia). Additionally, we found 1 citizen science record (research grade) that indicates the recent presence of *T. gaumeri* in Quintana Roo (Table 1). The vegetation of the site where this specimen was observed corresponds to medium sub evergreen forest.

Table 1. Evidence of the presence of the Yucatán mouse opossum (*Tlacuatzin gaumeri*) in the Mexican state of Quintana Roo in the Mastozoological Collection of El Colegio de la Frontera Sur (ECO-SC-M; San Cristóbal de Las Casas, Chiapas) as well as in the citizen science platform (research grade) iNaturalistMX.

Catalog number	Date of collection	Preservation type	Sex	Locality of collection	Geographic coordinates
ECO-SC-M 5479	13 March 1987	Fluid (skin, skull, and body	Male	Rancho Las Palmas, 30 km S Felipe Carrillo Puerto, Municipio Felipe Carrillo Puerto	19° 15' 36" N, 88° 7' 57" W
ECO-SC-M 5480	17 March 1987	Fluid (skin, skull, and body)	Female	Rancho Las Palmas, 30 km S Felipe Carrillo Puerto, Municipio Felipe Carrillo Puerto	19° 15' 36" N, 88° 7' 57" W
ECO-SC-M 5670	19 November 1995	Only skin	Male	27 km Chumpón-La Glorieta, Municipio Felipe Carrillo Puerto	19° 37' 0" N, 87° 47′ 0″ W
ECO-SC-M 6119	29 June 1998	Fluid (skin, skull, and body)	Female	Santuario del manatí, Rancho Monte Calvario, 8 km N Raudales, Municipio Othón P. Blanco	18° 46' 26" N, 87° 54′ 57″ W
iNaturalistMX observation 141657844	10 November 2022	Image	Undetermined	Municipio Felipe Carrillo Puerto	19° 53′ 7.2″ N, 87° 50′ 43.9″ W

Of the 5 records, 4 correspond to the east and southeast of the Municipality of Felipe Carrillo Puerto and only 1 to the northeast of the Municipality of Othón P. Blanco in the vicinity of Belize (Figure 1); only 1 record falls within a protected natural area (4; Figure 1) and 2 closer to the boundaries with the same (2-3, 5; Figure 1). The evidence found includes specimens in different preservation types and representing both sexes (Table 1).

The type locality of *T. gaumeri* is Yaxcabá, in the state of Yucatán (Zarza *et al.* 2003) and its holotype specimen (catalog number: Field Museum of Natural History_19995) consists of the skin and skull of a subadult (or young adult) of undetermined sex published in 1913 (Voss 2022). Of the new records reported here, the closest to that locality is: 27 km Chumpón - La Glorieta, and is at a distance of 126.5 km to the southeast (5; Figure 1).

For many years *T. gaumeri* was considered, first, a subspecies of *Marmosa canescens* and, later, a subspecies of *Tlacuatzin canescens*. Currently, few formal publications recognize the proper nomenclature and classification of *T. gaumeri* (Arcangeli *et al.* 2018; Burgin *et al.* 2018). Undoubtedly, this taxonomic situation contributed to generating little interest in the taxonomic and geographic study of this little-known Mexican mammal.

In fact, until before this study, *T. gaumeri* was known only from the states of Campeche and Yucatán. Now, the results of our research reveal the presence of this small marsupial also in the state of Quintana Roo, confirming its endemicity to Yucatán Península, México. The records together extend, on average, 139 km eastward from the Yucatán Península the geographic distribution of *T. gaumeri*. This is one of several examples that illustrate the importance of having curatorial information available from scientific collections. This allows us to verify the presence of a species without duplicating fieldwork. It should be noted that citizen science observations, on the other hand, complemented the results of our research. However, because of the difficulty involved in field recording of this species, the limited biological knowledge of the species and the non-academic taxonomic determination of the general public, citizen science observations should be taken with caution.

According to scientific collection records, one of the collection sites of *T. gaumeri* (4; Figure 1) is located within a protected natural area, the Sian Ka'an Biosphere Reserve. This data is relevant because it implies that part of the habitat of this Mexican mammal is in a protected natural area that can contribute to its conservation.

A complete field exploration of the Yucatán Península is still pending to define the presence-absence of *T. gaumeri*, to detail its association with specific vegetation types, and to estimate the conservation status of its populations. Especially because although the citizen science field observation is recent (2022; Table 1), the last record of scientific collection of this tlacuachín is, on average, 30 years ago (Table 1). Therefore, as with other poorly known species, it is necessary to determine whether the species is in any risk category (García-Aguilar *et al.* 2017) and identify factors that may be threatening its survival.

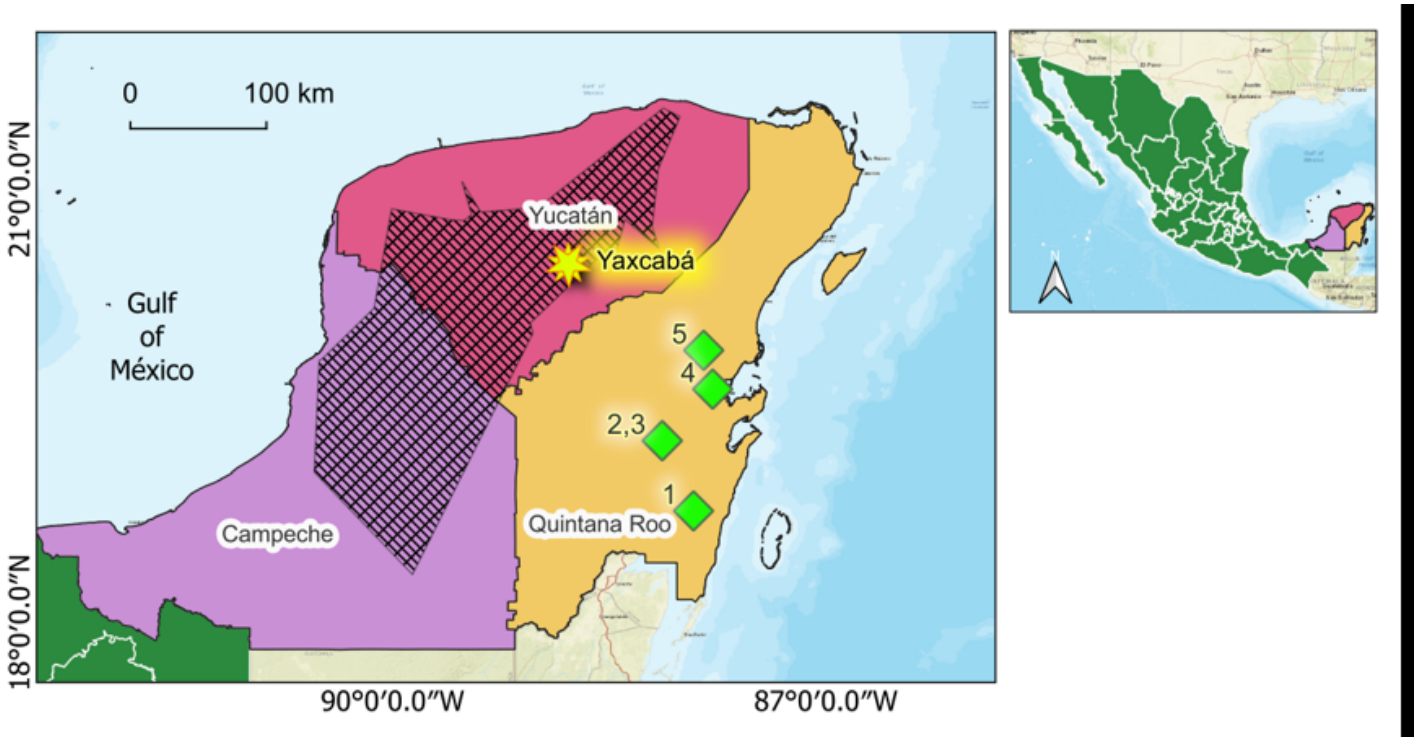

Figure 1. New records (green rhombi) of the presence of the Yucatán mouse opossum (*Tlacuatzin gaumeri*) in Quintana Roo, México. Rhombi 1 - 4 correspond to records kept in the Mammal Collection of El Colegio de la Frontera Sur (ECO-SC-M; San Cristóbal de Las Casas, Chiapas). Records 2 and 3 were collected at the same locality. Rhombus 5 is an observation (research grade) reported in iNaturalistMX. Yaxcabá (star) is the type locality of *T. gaumeri* (Zarza *et al.* 2003). The black shading indicates the known geographic distribution before the present study reported by González Christen and Rodríguez Santiago (2014) and by observations (research grade) from iNaturalistMX.

It is our wish then that, by having corroborated our expectations, this report will promote the recognition of *T. gaumeri* at a specific level and that the new records will help to provide appropriate information for faunal inventories and biodiversity assessments at the municipal and state level in the Yucatán Península.

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