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# Interaction between a Central American tapir and a domestic dog in southeastern Mexico

## Interacción entre un tapir centroamericano y un perro doméstico en el sureste de México

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## ABSTRACT

The spatial occurrence patterns of wild species are an expression of multiscale and multifactorial processes acting simultaneously. The introduction of domestic species in sites close to native species may culminate in interspecific competition. Interactions include predation by dogs, interference competition, exploitation competition, and disease-mediated competition. This note documents an event in which a tapir shows a negative interaction with a dog. The records reported in this note were located in the Santa Rosa ejido, in the municipality of Calakmul in the Selva Maya in southeastern Mexico. As part of the project "Monitoring wildlife in communities of Calakmul", 49 photo-trapping stations were placed from December 2021 to June 2022. With an accumulated sampling effort of 5,489 days/trap, where photographs were obtained showing a tapir in a defensive behavior towards a dog. The Maya Forest has been considered the area with the most important population of tapirs in Mexico, the increase in the human population and domestic animals, potentiates future interspecific interactions between native fauna and dogs, something relevant in relation to zoonosis in landscapes modified by humans.

**Keywords:** Calakmul; herbivores; interspecific interaction; mammals; zoonosis.

## RESUMEN

Los patrones de ocurrencia espacial de las especies silvestres son expresión de procesos multiescalares y multifactoriales que actúan simultáneamente. La introducción de especies domésticas en sitios cercanos a especies nativas puede culminar en una competencia interespecífica. Dentro de las interacciones que se pueden dar entre estas especies se consideran la depredación por perros, la competencia por interferencia, la competencia de explotación y la competencia mediada por enfermedades. En esta nota se documenta un evento en el que un tapir muestra una interacción negativa con un perro. Los registros reportados en esta nota se ubicaron en el ejido Santa Rosa, en el municipio de Calakmul en la Selva Maya en el sureste de México. Como parte del proyecto "Monitoreo de fauna silvestre en comunidades de Calakmul", de diciembre de 2021 a junio de 2022 se colocaron 49 estaciones de fototrampeo. Con un esfuerzo de muestreo acumulado de 5,489 días/trampa, donde se obtuvieron fotografías en las que se observa a un tapir en un comportamiento defensivo hacia un perro. La Selva Maya ha sido considerada el espacio con la población más importante de tapires en México, el incremento en la población humana y animales domésticos potencia futuras interacciones interespecíficas entre fauna nativa y perros, algo relevante en relación con la zoonosis en paisajes modificados por humanos.

**Palabras clave:** Calakmul; herbívoros; interacción interespecífica; mamíferos; zoonosis.

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## INTRODUCTION

Spatial distribution patterns are determined, at landscape or finer scales, by the evolutionary history of species, environmental factors such as the distribution of trophic resources (1,2) and by biotic interactions (1,3). Regarding herbivores, the coexistence of native species and domestic species may be due to historical processes that allow coexistence through the partitioning of spatial or trophic resources (4). However, the recent introduction of domestic species into sites near native species may culminate in interspecific competition, given that there has not been sufficient time for resource partitioning to evolve (4,5).

The Central American tapir (*Tapirus bairdii*; Tapiridae, Perissodactyla), also known as the "danto", is the largest terrestrial mammal in the Mexican neotropics (6). Its geographical distribution ranges from southeastern Mexico to northern Colombia (7). It mainly inhabits forests and wetlands, at elevations ranging from sea level to 3,600 m (8,9). In the Mexican Republic it is naturally distributed in the states of Campeche, Chiapas, Oaxaca, Quintana Roo, Veracruz, and possibly in Tabasco and Yucatán (7). It presents some affinity for lowlands and is highly water dependent (9) in addition, it plays a unique role in forest regeneration due to its feeding ecology as an herbivore and seed disperser (7). Internationally, the IUCN Red List of Threatened Species classifies *T. bairdii* as an "Endangered" species (10) while in Mexico it is listed in the "Endangered" category of NOM-059-SEMARNAT-2010 (11) and is considered a priority species for conservation (12).

The dog (*Canis familiaris*), on the other hand, is a mammal belonging to the Canidae family of the order Carnivora (13). It lives in association with human populations, which is why it is distributed practically everywhere on the planet. Globally, there are an estimated 700 million dogs, 75% of which are roaming and/or feral individuals resident in certain areas of Africa, the Middle East and Latin America (14). The fact that dogs roam freely allows them to interact with wild animals (15). Within these interactions are considered predation, interference competition, exploitation competition, and disease-mediated competition (16,15), which, coupled with the subsidy of humans and the global distribution of canines, create the right conditions for dogs to be recognized as a global threat to biodiversity conservation (17). Because of the importance of documenting interspecific interactions between wildlife and domestic animals, this note describes an event in which a tapir shows a negative interaction with a dog in the Maya Forest in southeastern Mexico.

## MATERIALS AND METHODS

The records reported in this note were obtained in the Santa Rosa ejido, belonging to the municipality of Calakmul, in the state of Campeche, which is located approximately 14 km east of the Calakmul Biosphere Reserve in the Yucatan Peninsula, Mexico. The area has a warm, sub-humid climate (Aw), with an average annual temperature of 24.6 °C. The terrain is mainly flat with small hills, with elevations ranging from sea level to 300 m. The dominant vegetation types are high evergreen forest, medium sub evergreen forest, medium sub deciduous forest and low sub deciduous forest.

As part of the project "Wildlife monitoring in communities of Calakmul", from December 2021 to June 2022, 49 photo-trapping stations were installed in communities of Calakmul. The stations consisted of Bushnell, Browning or Cuddeback digital camera-traps, which were placed 40-50 cm off the ground, in trees adjacent to lightly traveled trails, logging roads and bodies of water, and were programmed to take photographs 24 hours a day, with 5-second intervals between shots. A minimum distance of 2 km was maintained between each device. To avoid overestimating the number of wildlife records, only independent photographic events were considered during the analyses, these being those that met the following criteria: a) consecutive photographs of individuals of different species, and b) photographs of individuals of the same species separated by more than 24 hours.

## RESULTS

With an accumulated sampling effort of 5,489 days/trap, a series of six photographs were obtained, where a tapir (male, adult) is clearly observed running after a white dog (male, adult) until the borders of an area with vegetation, where it apparently stops following the canid (Figure 2a-2c). Subsequently (two minutes later), the same dog is observed, now in an offensive position, barking and harassing the tapir (Figure 2d-2f). This event occurred on February 04 of 2023, at the coordinates 18.00874, -89.186526; WGS84, between 16:30 and 16:32 h (Figure 1). The photo-trapping station where the interaction described in this note was recorded was located at the edge of an "aguada" (natural water body), surrounded by a matrix of medium sub evergreen forest. The distance between the site of the event and the nearest town was approximately 2.5 km. The documented interaction between these two mammals suggests that it is a defensive behavior on the part of the tapir towards the dog.

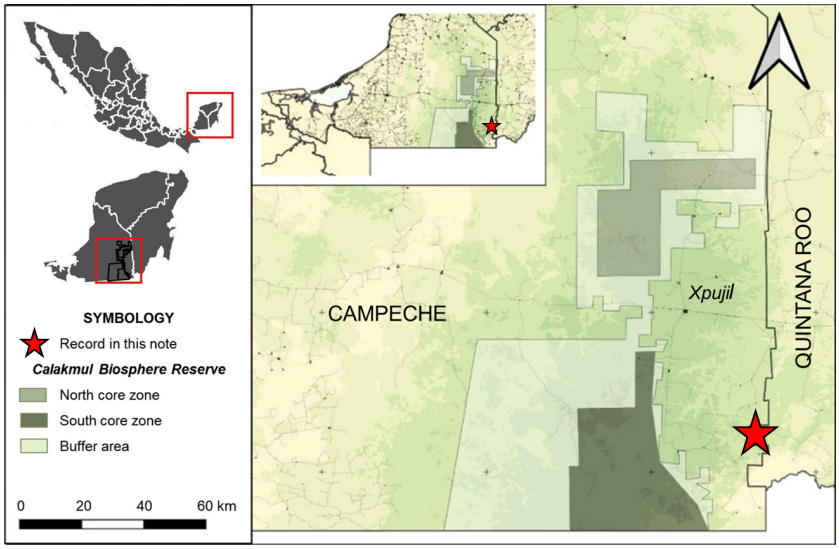


**Figure 1.** Location of photographic records of tapir interacting with a dog in the Santa Rosa ejido, Calakmul, Campeche, Mexico. The precise location is shown as a red star.


**Figure 2**. The figure shows in continuous moments an adult tapir individual chasing a dog (2a-2c), right at the edge of a waterhole. In figures (2d-2f) the same dog is observed in offensive behavior, presumably harassing wildlife, probably the same tapir.

## DISCUSSION

This record represents one of the few observations of the defensive behavior of the Central American tapir, documented events of the species in the wild that are very scarce in the literature. Likewise, one of the negative impacts derived from the presence of domestic feral or wandering species on wildlife is evidenced; in this case associated to one of the defensive behaviors that tapirs may present.

Compared to other Perissodactyla, tapirs may not be as flexible as equids in their torso-lumbar movements, and certainly are not armored as in the Rhinocerotidae family (i.e., horns and thick skin with layers of collagen), however, tapirs are heavy and bulky animals that can "run" for short distances (18). In the Calakmul region, it has been mentioned anecdotally that some tapirs (mainly females) charge at people when disturbed, especially when they have small cubs (Contreras-Moreno pers. comm.). The defensive behavior of this ungulate was recorded in a study in Costa Rica, where a tapir chased individuals of *Desmodus rotundus* that tried to feed on it, and as a defense it followed them (19), however, this behavior has been scarcely described in the wild.

Within interspecific interactions with dogs, it has been documented that interference competition can significantly affect wildlife biological processes (16,15). In this regard, in some places in South America, dogs have been recorded to be efficient at chasing pudu (*Pudu puda*) and that both predation and non-lethal consequences (avoidance) of harassment may be shaping the distribution of this small ungulate (13).

The Maya Forest has been considered the area with the most important population of tapirs in Mexico (12), likewise the Calakmul region maintains a great biocultural richness that in recent years has been changing rapidly due to the development of large tourism infrastructure, land transportation (railroads, roads, stations) (20), new settlements or development poles proposed to increase the economic flow of tourism in the region, but also the demand for spaces, goods and services. This increase in the human population could lead to an increase in the presence of domestic or wandering animals that could be interacting with native fauna in the region, impacting wildlife populations in multiple ways (16), so the findings in this note accentuate the importance of deepening the study of the impact on wildlife populations.

### Conflict of interest

We declare that we have no conflicts of interest with respect to the work presented in this note.

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