NOTES

Mammalogy Notes ISSN 2382-3704
https://doi.org/10.47603/mano.v8n1.302

Natural History

Interference competition between *Pecari tajacu* and *Odocoileus virginianus*

Khiavett G. Sanchez-Pinzón[1*], Nicolas Arias Domínguez[2]

1 El Colegio de la Frontera Sur. Av. Rancho Polígono 2A, Parque Industrial, Lerma, CP. 24500, Campeche, México.
2 Ejido Nuevo Becal, Calakmul, México.
* Correspondence: kgsanchez@ecosur.edu.mx

Resumen

Las especies simpátricas al tener requerimientos similares tienden a competir por los recursos, sobre todo en sitios donde estos son limitados. A través de un monitoreo con cámaras trampa en cuerpos de agua en la Región de Calakmul, se registraron dos eventos de competencia por interferencia entre el pecari de collar (*Pecari tajacu*) y el venado cola blanca (*Odocoileus virginianus*), confirmando este comportamiento antagonista como una estrategia para acceder a un recurso compartido y limitante en esta zona.

Palabras clave: Región de Calakmul, cámaras trampa, recurso, aguadas.

Abstract

Sympatric species, having similar requirements, tend to compete for resources, especially in places where these are limited. Through monitoring with camera traps in waterholes in the Calakmul Region, two competition events were recorded due to interference between the collared peccary (*Pecari tajacu*) and the white-tailed deer (*Odocoileus virginianus*), confirming this antagonistic behavior as a strategy to access a shared and limited resource in this zone.

Key words: Calakmul Region, camera traps, resource, waterholes.

The collared peccary (*Pecari tajacu*) and the white-tailed deer (*Odocoileus virginianus*) are two of six ungulates species that are distributed in the Neotropical forest of Mexico. Both species are basically generalists and they share a great portion of their distribution range in Mexico. Collared peccary is an omnivores species but with a preference for plant material such as fruits, seeds, and roots (Ticer et al.1994, Mayers & Brandt 1982), while white-tailed deer is a browser with preferences for herbaceous and secondary vegetation plants (Rojas & Gallina 2000, Gallina 1993). Given that habitat selection in animals is dictated in great portion by food and water availability, it is highly probable that these two species compete for resources in time and space in the areas where they live sympatrically (Ramírez-Lozano 2004, Masters et al. 1995).

Competition is one of the fundamental ecological processes that develops and shapes a biological community (Gaxiola & Armesto 2012). The individuals competing may belong to the same species (intraspecific competition) or different species (inter-specific competition), and competition can occur in two ways, exploitation or interference (Park 1962). Exploitation competition occurs when a species uses resources and depletes them for other species but there is no physical contact among them, while interference

competition involves behavioral interactions among them that can lead to physical contacts such as fights, or even deaths (Polis et al. 1989).

As part of a monitoring program of waterholes at Calakmul Biosphere Reserve a tropical forest located in Campeche, México, we deployed automated camera traps to record wildlife visits from 2014 to 2020. These waterholes are ephemeral ponds that collect rainwater and are the most important source of water for wildlife and for human communities that live around the protected area (Reyna-Hurtado et al. 2010). In all these years, the collared peccary and the white-tailed deer were the two e most frequent species that visited these waterholes. Sometimes visiting, the same waterholes but at different times (Sanchez-Pinzón et al. 2020, Ramírez-Ortiz 2016). However, on 2 occasions we recorded 2 encounters between individuals of the two species and in both times the collared peccary showed aggressive behavior toward the white-tailed deer. The first event occurred on 27 November 2014 in a pond located in the core of the Calakmul Biosphere Reserve (18°18'42.88'' N, 89°51'20.52 W). That day at 9:13 am a white-tailed deer was feeding on some herbaceous plants in a dry waterhole when suddenly a collared peccary appears and chased the deer (Figure 1). The second encounter occurred in June of 2018 in a pond located in the community of Nuevo Becal (18°39'47.82 N, 89°13'02.15 W), adjacent to Calakmul Biosphere Reserve where a video recorded a deer running away from a collared peccary.

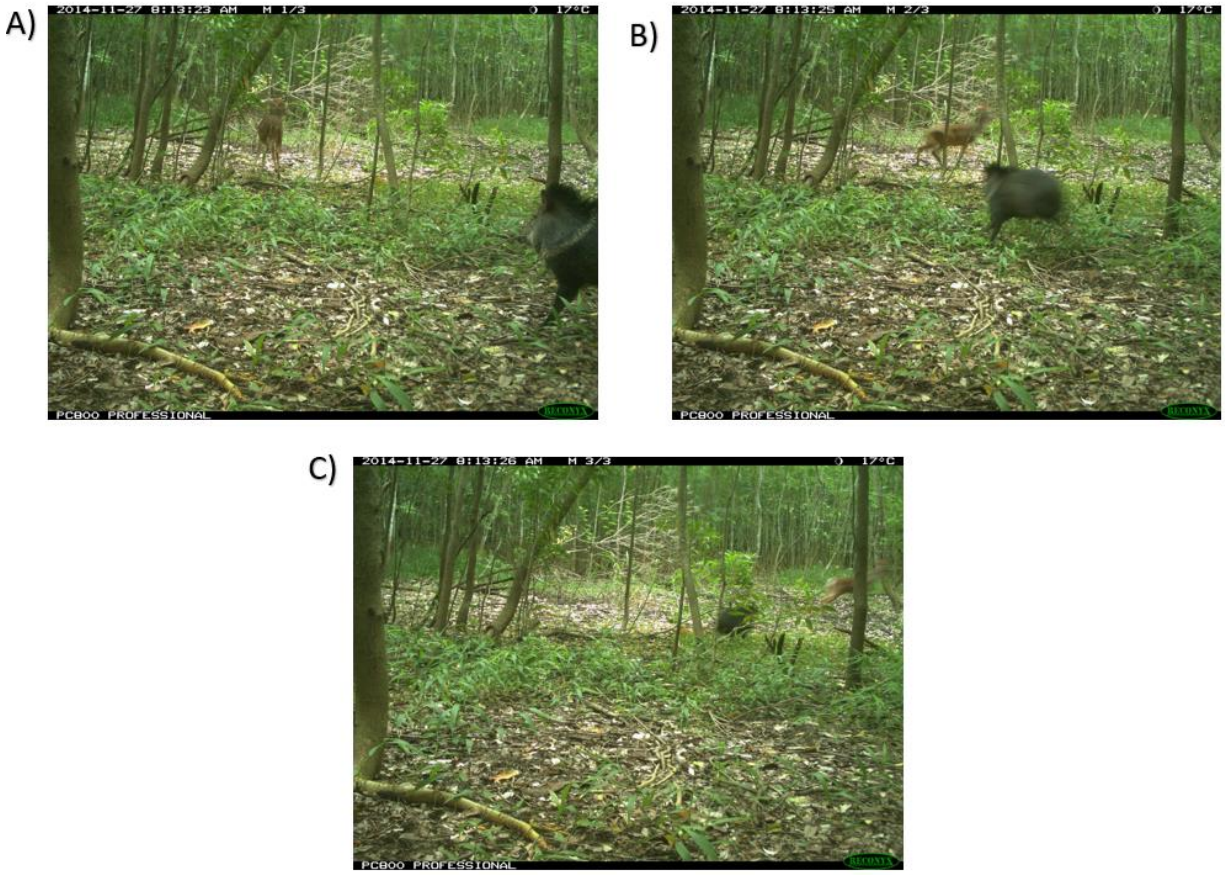

FIGURE 1. Collared peccary (*Pecari tajacu*) chasing a white-tailed deer (*Odocoileus virginianus*) in a waterhole in the Calakmul Biosphere Reserve, Mexico.

This aggressive behavior from collared peccary toward white-tailed deer has been documented in Texas where collared peccary chased white-tailed deer from some food supply containers. From twelve events recorded when the two species coincided, the collared peccary chased away the white-tailed deer. Sometimes the deer returned after the collared peccaries have left the place but most of the time the deer did not come back within the next 24 hours (Zaiglin & DeYoun 1989). In San Francisco Texas, Michael (1967) observed 2 times that collared peccaries chased away white-tailed deer and 2 additional times when the deer alone ran when collared peccaries get close. These 4 records occurred in sites where both species feed. The author (Michael 1967) concluded that white-tailed deer in the area seem to fear more the presence of collared peccaries than bobcats (*Linx rufus*) or coyotes (*Canis latrans*).

This new record of competition by interference between the collared peccary and the white-tailed deer in a tropical forest contributes to reaffirming this antagonist behavior between the two species in the wild. Behavior that probably is more frequent in the feeding sites such as the waterholes of Calakmul Biosphere Reserve. The Calakmul region is characterized by marked seasonally changes between rain and dry season, and by lacking running water bodies and the only source of water are ephemeral ponds known locally as "aguadas" (García-Gil 2002, Reyna-Hurtado et al. 2010). In the years 2015 to early 2020, a dry period impacted the with annual precipitation below average and caused several waterholes not to fill enough water and some of them dried up (Reyna-Hurtado et al. 2019, Zúñiga-Morales & Sima-Panti 2015, Mardero et al. 2012). This situation probably caused that a limited resource such as water can increase the encounters among species and consequently the competition processes such as the ones we observed between the collared peccary and the white-tailed deer (Sanchez-Pinzón et al. 2020).

For collared peccary the Calakmul waterholes are essential components of the landscape as they visit these sites to drink and wallow in the mud, a behavior favored by suids and similar species (Sowls 1997) that helps the individual to lower their body temperature and to get rid of external parasites (Reyna-Hurtado 2014). For white-tailed deer, the Calakmul waterholes are foraging sites where a lot of secondary vegetation grows (Sánchez-Rojas & Gallina 2000). It is clear that in this relationship the collared peccary is the dominant species that limit access to resources for white-tailed deer. We do not know if the white-tailed deer always run away when a collared peccary is present or if they have other behavioral strategies such as hiding or modifying its activity time. These are topics for future research.

This study suggests how waterholes are important and interesting sites to monitor wildlife and its interactions. Documenting these ecological interactions that occur in the middle of tropical forests is very important for understanding the strategies that the species utilized to survive and access limited resources such as water. This information is essential to elaborate management and conservation actions for the species and its habitat in this region considered a conservation priority.

ACKNOWLEDGMENTS

To the Calakmul Biosphere Reserve and the Nuevo Becal community authority for all the help provided in the field. This study was funded by a grant (182386 CONACYT Ciencia Basica 2012).

REFERENCES

Gallina S. 1993. White-tailed deer and cattle diets at La Michilia Durango, México, Journal. of Range Management, 46(6), 487-492. https://doi.org/10.2307/4002857

García-Gil G. 2003. Colonización humana reciente y formación del paisaje agrario en la Reserva de la Biosfera de Calakmul, Campeche, México (Ph.D. Dissertation). Universidad Nacional Autónoma de México, México, D. F.

Gaxiola A, Armesto JJ. 2012. Ecología y evolución de las interacciones bióticas. En Del Val E y Boege K (Eds.), Competencia (pp.15-42). Universidad Nacional Autónoma de México-Fondo de Cultura Económica. México, D.F.

Hardin G. 1960. The Competitive Exclusion Principle. Science, 131(3409), 1292–1297. http://www.jstor.org/stable/1705965

Mayer JJ, Brandt PN. 1992. Identify, distribution and natural history of the peccaries, Tayassuidae. Pp. 433-455, en: Mammalian Biology in South America (Mares, M. A. y H. H. Genoways, eds.). Special Publication Series 6, Pymanuting Laboratory of Ecology, University of Pittsburgh, Linesville.

Mardero S, Nickl E, Schmook B, Schneider L, Rogan J. 2012. Sequias en el sur de la península de Yucatán: análisis de la variabilidad anual y estacional de la precipitación. Investigaciones Geográficas, Boletín del instituto de Geografía, UNAM, México 78: 19–33. https://doi.org/10.14350/rig.32466

Masters R, Bidwell TG, Shaw M. 1995. Ecology and Management of deer in Oklahoma. F-9009. Oklahoma Cooperative Extension Service. Division of Agricultural Sciences and Natural Resources, Oklahoma State University, pp 1-9.

Michael ED. 1967. Behavioral interactions of deer and some other mammals. The Southwestern Naturalist, 156-162. https://doi.org/10.2307/3669269

Park T. 1962. Beetles, competition and populations. Intricate ecological phenomenon is brought into laboratory and studied as an experimental model. Science, 138(3548):1369-1375.

Polis G.A, Myers CA, Holt RD. 1989. The ecology and evolution of intraguild predation-potential competitors that eat each other. Annual Review of Ecology and Systematics, 20:297-330. https://doi.org/10.1146/annurev.es.20.110189.001501

Ramírez-Lozano RG. 2004. Nutrición del Venado Cola Blanca. Editorial UANL.

Ramírez-Ortiz LM. 2016. Abundancia relativa y patrones de actividad por venados en dos sitios de la Región de Calakmul. Tesis de Licenciatura de la Universidad Autónoma de Campeche.

Reyna-Hurtado R. et al. 2019. Tapir population patterns under the disappearance of free-standing water. Therya, vol. 10, no 3, p. 353. https://doi.org/10.12933/therya-19-902

Sanchez-Pinzón K, Reyna-Hurtado R, Naranjo EJ, Keuroghlian A. 2020. Peccaries and their relationship with water availability and their predators in Calakmul, México. Therya, 11(2), 213-220. https://doi.org/10.12933/therya-20-878

Sánchez-Rojas G, Gallina S.2000. Mule deer (*Odocoileus hemionus*) density in a landscape element of the Chihuahuan Desert, Mexico. Journal of Arid Environments, 44(3), 357-368. https://doi.org/10.1006/jare.1999.0605

Sowls LK. 1997. Javelinas and other peccaries: their biology, management, and use. The Texas A&M University Press. College Station, EE. U.

Ticer CLD, Ockenfels RA, Devos JC Jr, Morrell TE. 1998. Habitat Use and Activity Patterns of Urban-Dwelling Javelina. Urban Ecosystems **2**, 141–151. https://doi.org/10.1023/A:1009581632050

Zaiglin RE, DeYoung CA. 1989. Supplemental feeding of free-ranging deer in south Texas. Texas Journal of Agriculture and Natural Resources, 3, 39-41. https://txjanr.agintexas.org/index.php/txjanr/article/view/296

Zúñiga-Morales JA, Sima-Pantí D. 2015. Estrategia de mitigación y adaptación al cambio climático en Calakmul: una historia de éxito. Boletín de la Comunidad de Aprendizaje de Áreas Naturales Protegidas, 1: 5-9

Editor: Diego J. Lizcano
Recibido: 2022-01-10
Revisado: 2022-02-15
Aceptado: 2022-09-25
Publicado: 2022-09-25