



# A Terciopelo (*Bothrops asper*) Swimming in the Caribbean: Intentional Behavior or Fortuitous Event?

Roger Morales-Flores<sup>1,2</sup>, and Ángel Sosa-Bartuano<sup>2,3</sup>

<sup>1</sup>Fundación Los Naturalistas, P.O. Box 0426-01459 David, Chiriquí, Panamá

<sup>2</sup>Red Mesoamericana y del Caribe para la Conservación de Anfibios y Reptiles (Red MesoHerp)

<sup>3</sup>Museo de Vertebrados de la Universidad de Panamá, Ciudad de Panamá, Panamá (asosa2983@gmail.com)

The ability to swim is a characteristic common to all snakes, including those that are not considered strictly aquatic (Pauwels et al. 2008). Despite the vast expanse of the oceans, only a small percentage of snake species have successfully adapted to marine life (Murphy 2012). However, several snake families, such as the Acrochordidae, Homalopsidae, Dipsadidae, and Natricidae, have representatives that inhabit both brackish and marine waters in addition to freshwater environments (Rasmussen et al. 2011; Murphy 2012). Multiple records document snakes in the family Viperidae, especially in the genus *Crotalus*, swimming in open freshwater, such as lakes and rivers (Ferrante et al. 2015; Warning and Covy 2016; Carbajal-Márquez and Cedeño Vásquez 2017); however, information on swimming in marine waters is sparse. Eastern Diamondback Rattlesnakes (*Crotalus adamanteus*) have been observed swimming between the Florida Keys (Klauber 1972; Armstrong and Murphy 1979; Campbell and Lamar 2004), Red-tailed Bamboo Pitpipers (*Trimeresurus erythrurus*) have occasionally been observed swimming short distances during high tide in the Sunderbans of India (Deuti et al. 2021), and Terciopelos (*Bothrops asper*) have been seen in the Caribbean Sea of Bocas del Toro, Panama (Sosa-Bartuano 2023). Additionally, a Red Diamond Rattlesnake (*Crotalus ruber*) was observed swimming in marine waters in California, USA, although this was involuntary as it was washed from a river into the ocean (Lillywhite 2014).

The genus *Bothrops* comprises approximately 48 species (Uetz et al. 2024), with *Bothrops asper* (Garman 1884) having the widest distribution. This species is native to the Neotropical lowlands and adjacent mountainous areas from southern Mexico through Central America to Colombia, Venezuela, western Ecuador and northwestern Peru (Arteaga et al. 2020; Solórzano 2022). These snakes occupy a wide variety of habitats at elevations from sea level to 2,640 m (Sasa et al. 2009; Wallach et al. 2014). Despite its abundance

and extensive range, information on the natural history of *B. asper* remains limited (Ramírez-Arce et al. 2021). This species exhibits considerable dispersal capacity, with a recorded movement of over 1,200 m during a two-night period, including the crossing of a wide and high-flowing river (Sasa et al. 2009). Its adaptability to a variety of habitats, including those altered by anthropogenic actions, may further contribute to its dispersal and to the fact that it is the primary cause of snakebites in Central America (Sasa et al. 2009; Ramírez-Arce et al. 2021).

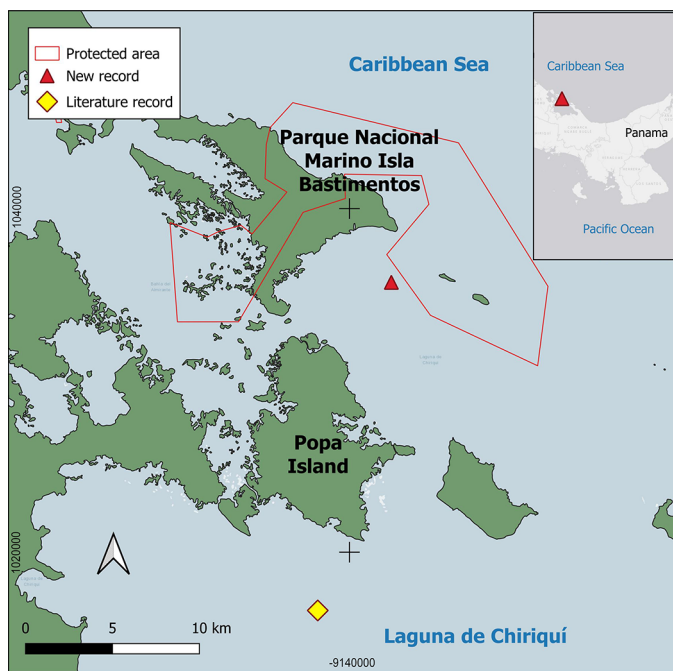
On 16 April 2022, Gustavo Smith and Miguel Ibarra observed a *Bothrops asper* swimming in the open sea during the day (Fig. 1). The observers, local ecotourism guides with extensive knowledge of the regional fauna, reside in the Bocas del Toro Archipelago, where *B. asper* is a common species. Although another person took a photograph with a professional camera, a copy is not available, but this allowed the identification of the snake by observing in detail the distinctive X-shaped marks on the back and the head noticeably wider than the rest of the body. This event occurred in the Bocas del Toro Archipelago, between Popa Island and Cayo Zapatilla (9.2633, -82.0841; Fig. 2), near the



**Figure 1.** A Terciopelo (*Bothrops asper*) swimming in the open sea between Isla Popa and Zapatilla Island, Province of Bocas del Toro, Panama. Photograph by Gustavo Smith and Miguel Ibarra.

boundary of the Isla Bastimentos National Marine Park. The minimum distance to the mainland was 13.5 km. The closest island was Cayo Zapatilla at a distance of 2.8 km. The exact time was not recorded. This observation was approximately 19 km northwest of the previous observation of a Terciopelo swimming in the Caribbean (Sosa-Bartuano 2023).

Terciopelos swimming in the Archipelago of Bocas del Toro appear to be an intentional behavior and not the result of fortuitous events, such as being carried into the sea by a flooding river (Sosa-Bartuano 2023). We suggest that this behavior is driven by factors that might include exploration of new areas or search for prey. These observations support the suggestion of Saldarriaga-Córdoba et al. (2017) regarding the role of inter-island movement in the dispersal of *B. asper* toward Central America, and further reinforces the notion that this species may have actively crossed short distances in the open sea during the formation of the Isthmus of Panama, utilizing islands as “stepping stones.” Future research employing radio telemetry, as suggested by Sasa et al. (2009), could provide a test of this hypothesis.



**Figure 2.** Map showing the two localities where Terciopelos (*Bothrops asper*) were observed swimming in the Caribbean Sea at Bocas del Toro, Panama. The previous literature record at the Laguna de Chiriquí is marked by the yellow diamond, the new record is indicated by the red triangle, and the boundary of the Parque Nacional Marino Isla Bastimentos is outlined in red.

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