

# Annotated checklist on non-avian reptiles of Puerto Wilches, middle Magdalena River basin, Colombia

## Lista comentada sobre los reptiles no aviáres de Puerto Wilches, cuenca media del río Magdalena, Colombia

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**Recibido:** noviembre 8, 2024

**Aceptado:** septiembre 9, 2025

**Publicado en línea:** febrero 19, 2026

<https://doi.org/10.21068/2539200X.1274>



### Resumen

En este estudio presentamos la composición de los reptiles no aviáres registrados en el área de influencia de proyectos piloto de fraccionamiento hidráulico en el municipio de Puerto Wilches, departamento de Santander, Colombia. Entre 2021 y 2022 se realizaron 362 horas-hombre de muestreo, mediante 120 transectos diurnos y nocturnos distribuidos en distintos hábitats. Se registraron 50 especies pertenecientes a los órdenes Crocodylia, Squamata y Testudines, y para cada una, cuando fue posible, se aportó información morfolométrica y de historia natural. Destacamos el hallazgo de dos posibles especies no descritas (*Atractus* sp. y *Lepidoblepharis* sp.), así como nuevos aportes sobre especies endémicas (*Dryophilax gambotensis*, *Helicops danieli*, *Micrurus camilae*) y poco conocidas (*Alopoglossus festae*, *Enuliophis sclateri*, *Sphaerodactylus lineolatus*). Los resultados resaltan la necesidad de implementar medidas de conservación ante el riesgo de disminución poblacional de los reptiles debido a amenazas locales.

**Palabras clave:** herpetofauna, inventarios biológicos, biogeografía neotropical, impacto antrópico, ecosistemas ribereños.

## Abstract

In this study, we present the composition of non-avian reptiles recorded in the area of influence of pilot fracking projects in the municipality of Puerto Wilches, Department of Santander, Colombia. Between 2021 and 2022, 362 person-hours of sampling were conducted through 120 diurnal and nocturnal transects distributed across different habitats. A total of 50 species belonging to the orders Crocodylia, Squamata, and Testudines were recorded, and, when possible, morphometric and natural history information was provided for each species. We highlight the discovery of two potentially undescribed species (*Atractus* sp. and *Lepidoblepharis* sp.), as well as new information on endemic species (*Dryophilax gambotensis*, *Helicops danieli*, *Micrurus camilae*) and poorly known species (*Alopoglossus festae*, *Enuliophis sclateri*, *Sphaerodactylus lineolatus*). These results underscore the need to implement conservation measures in light of the risk of population declines due to locally identified threats.

**Keywords:** herpetofauna, biological inventories, Neotropical biogeography, anthropogenic impact, riparian ecosystems.

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## Introduction

The middle Magdalena River basin (hereafter mMRB) is located in the trans-Andean region of Colombia. This valley, framed by the Central and Eastern Cordilleras, harbors a variety of terrestrial and aquatic ecosystems. Until the early 20th century, primary rainforest persisted in the region (Palacio et al., 2001). However, a succession of human activities—including railway and road construction, oil extraction, monoculture farming, and urban settlements—has significantly reduced the natural forest cover (Palacio et al., 2001; Armenteras et al., 2011, 2013). This profound environmental transformation has decreased natural habitats, with consequent impacts on wildlife in the mMRB (Ocampo-Peñuela et al., 2018; Pardo & Ocampo-Peña, 2019). For reptiles (Class Reptilia), the extent to which non-avian clades (excluding turtles and crocodiles; Páez et al., 2012) have been affected remains poorly understood. Therefore, compiling baseline biological data to consolidate species lists and diversity metrics, and relating these to human ecosystem use, is essential for assessing population status (Morales-Betancourt et al., 2013) and informing management and conservation strategies. The combination of significant knowledge gaps across several biological groups and accelerated habitat conversion makes the mMRB a high-priority region for research and conservation (Etter, 1998; Castaño-

Uribe, 2003; Rojas-Morales & González-Carvajal, 2024).

The non-avian reptile fauna of this region is notable for its rich diversity and zoogeographic affinities, primarily with the Chocó rainforest and the Caribbean region (Moreno-Arias et al., 2008; Medina-Rangel, 2011, 2013; Restrepo et al., 2017; Vargas-Salinas & Aponte-Gutiérrez, 2016; Rojas-Morales et al., 2018; Meza-Joya et al., 2020), and, to a lesser extent, with the Amazonia (Lynch, 2009; Lynch et al., 2014; Acosta-Ortiz & Aponte-Gutiérrez, 2017; Rojas-Morales et al., 2018). Recent studies on mMRB reptiles have highlighted their importance for ecological functionality, particularly in the aquatic-terrestrial interface of the Magdalena River and its tributaries (Páez et al., 2012; Medina-Rangel & Cárdenas-Arévalo, 2015; Flórez-Jaramillo & Barona-Cortés, 2016; Vargas-Salinas & Aponte Gutiérrez, 2016; Restrepo et al., 2017). Although research has increased in recent decades, primarily driven by environmental licensing requirements, much of the resulting information is only available as datasets in biodiversity repositories (e.g., SiB Colombia, GBIF). While publishing these datasets is a crucial step forward, the broader dissemination and utility of this information would be enhanced by accompanying analyses and interpretations that make the findings accessible to a broader audience.

The recent proposal of fracking pilot projects in the mMRB has ignited significant media and public debate in Colombia. In this context, during 2021–2022, a team of over 60 scientists conducted a comprehensive biodiversity assessment in the mMRB to establish a baseline, encompassing a broad spectrum of biological communities (i.e., plants, terrestrial and aquatic fauna) (Instituto Humboldt & Agencia Nacional de Hidrocarburos, 2022). Preliminary findings from this effort have yielded some natural history observations (Salazar-Guzmán et al., 2022; Moreno-Niño et al., 2024; Hernández-Leal et al., 2024). Based on this work, the present paper provides an annotated checklist of the recorded non-avian reptiles. It includes morphometric details, habitat, and microhabitat use data, and highlights geographic distribution novelties for the Magdalena River basin. By coupling this analysis with an openly accessible dataset, we aim to make our research transparent and accessible to the broadest possible audience.

## Materials and Methods

### Study area

This study was conducted in the municipality of Puerto Wilches, in the Santander Department, located within the mMRB. The study area comprised a 66,058 hectares polygon, with elevations ranging from 50 to 200 m a.s.l. (Figure 1). Ecologically, the area is classified as a Tropical Humid Forest (Bh-T) (Etter, 1998), corresponding to the Middle Magdalena Tropical Humid Zonobiome (Rodríguez et al., 2006). The climate is warm and humid, with a mean annual temperature of 28.8 °C and annual precipitation ranging from 2,779 to 3,000 mm (IDEAM, 2005). An analysis of monthly averages for the period 2020–2023, based on data from Puerto Wilches (IDEAM, 2024), revealed minimal monthly temperature variation (minimum: 27 °C in October and November; maximum: 27.7 °C in December). In contrast, average monthly precipitation varied considerably, ranging from 22.5 mm in February to 1,081 mm in June, with a sharp decrease in the months preceding and following June (Figure 2). The landscape of Puerto Wilches is dominated by oil palm

plantations (*Elaeis guineensis* Jacq.), interspersed with natural cover types such as riparian forests, dense forests, shrublands, and flooded grasslands (Figure 1, Figure 3). The municipality is also characterized by a network of swamps connected to the Magdalena River, including Paredes, Montecristo, Corredor, and Yarirí, with the Paredes swamp being the largest lentic water body in the study area.

### Field work and data gathering

Two field expeditions were conducted: the first from 2 July to 4 August 2021, and the second from 17 March to 11 April 11, 2022. In each period, 40 sampling sites were surveyed (Figure 1). Based on the landscape structure, different habitat types were selected for sampling non-avian reptiles: Dense Forest (Df, n = 4 sites), Open Forest (Of, n = 1), Riparian Forest (Rf, n = 23), Shrublands (Sh, n = 6), Pastures (Pa, n = 1), Swamps (Sw, n = 4), and Roads (R, n = 4). All these habitats are embedded within a landscape matrix predominantly composed of oil palm monocultures (Figure 1).

At each site, three parallel transects (200 x 4 m) were established and surveyed by a team of two researchers accompanied by a local guide. Transect surveys were conducted during two daily periods: 13:00–17:30 h and 18:30–23:30 h. The logistical and social conditions of the study area determined this sampling design.

The primary sampling method was Visual Encounter Survey (VES; Crump & Scott, 1994), involving low walks along transects while actively searching visually accessible microhabitats for reptiles (e.g., leaf litter, bare soil, logs, leaves, branches, rocks) (Martins & Oliveira, 1998; Urbina-Cardona et al., 2006). This included inspecting water bodies such as streams and ponds. Individuals were captured manually or with herpetological hooks, particularly venomous snake species.

This methodology was complemented by recording fauna-vehicle collisions (roadkill). Roadkill sampling was conducted 50 effective days (ten days per month) during November and December 2021, and January, March, and April 2022, totaling 206.9 survey hours.

Daily surveys were conducted by two researchers, driving on Puerto Wilches roads between 06:00 and 11:00 h at speeds below 20 km/h. Specimens recorded in the field were collected whenever their condition was suitable for preservation and subsequent inclusion in the IAvH-R collection.

### Species identification

Species identification during fieldwork was based on field guides and specialized taxonomic keys (Rengifo & Lündberg, 1999; Köhler et al., 2012; Carvajal-Cogollo et al., 2020). To validate the taxonomic identification, 89 individuals belonging to Squamata were collected at the Reptile Collection of the Instituto Alexander von Humboldt (IAvH-R) (Table 1S). Turtle and caiman specimens were not collected to avoid local overharvesting pressure on these taxa.

Collected specimens were processed in the field following Duellman (1962), with minor modifications. Specimens were subsequently preserved in 70% ethanol, and tissue samples were stored in 99% ethanol. Voucher specimens were deposited in the IAvH-R collection, and tissue samples were archived in the Tissue Collection (IAvH-CT) (Table 1S).

Specimens were collected in accordance with Article 2.2.2.2.8.1.2 of Decree 1076 of the Ministerio de Ambiente y Desarrollo Sostenible (2015). When available, snout-vent length (SVL) and tail length (TL) are reported as mean  $\pm$  standard deviation and range (mm) for each species.

The datasets generated and analyzed in this study are publicly available through the Global Biodiversity Information Facility (GBIF) under the identifiers *Línea base general de reptiles para el valle medio del Magdalena* and *Línea base general de atropellamiento para el valle medio del Magdalena - VMM (versión 2.1)*, published by the Instituto de Investigación de Recursos Biológicos Alexander von Humboldt and the Agencia Nacional de Hidrocarburos (2022).

## Results

### Taxonomic richness

After 362.01 person-hours of fieldwork conducted by four researchers, and an additional 206.9 person-hours of roadkill surveys conducted by two researchers, we recorded a total of 1,056 individuals representing 46 genera and 50 species of non-avian reptiles. These records comprised the following orders: Crocodylia (1 species), Testudinata (3 species), and Squamata, including Sauria (19 species) and Serpentes (27 species).

In terms of taxonomic diversity, the most species-rich families were Colubridae, with 19 species (38% of the total), followed by Teiidae with five species (10%) and Sphaerodactylidae with four species (8%). All remaining were represented by one or two species (Table 1; Table 2S).

**Table 1.** Number of genera and species of non-avian reptiles recorded in Puerto Wilches, Santander, Colombia, by taxonomic family. Information on endemic species is provided in the remarks for the corresponding taxa.

Order - Suborder/Family	Number of genera	Number of species	Number of species restricted to Colombia	Number of species restricted to the Magdalena River Basin
<b>Amphisbaenia</b>				
Amphisbaenidae	1	1		
<b>Crocodylia</b>				
Alligatoridae	1	1		
<b>Squamata - Sauria</b>				
Alopoglossidae	1	1		
Anolidae	1	2		
Corytophanidae	1	1		
Diploglossidae	1	1		
Gekkonidae	1	1		
Gymnophthalmidae	2	2		
Iguanidae	1	1		
Phyllodactylidae	1	1		
Scincidae	1	1		
Sphaerodactylidae	3	4		
Teiidae	4	4		
<b>Squamata - Serpentes</b>				
Anomalepididae	1	1	1	1
Boidae	2	2		
Colubridae	18	19	2	1
Elapidae	1	2	1	1
Viperidae	2	2		
<b>Testudines - Cryptodira</b>				
Emydidae	1	1		
Geoemydidae	1	1		
Kinosternidae	1	1		

## Annotated checklist

Class Reptilia

Order Squamata

Family Amphisbaenidae

***Amphisbaena fuliginosa*** Linnaeus, 1758

Measurements. SVL: female 296 mm; TL: 48 mm.

Climatic season. Dry.

Time of record. 07:05 h.

Habitat. R (1), Rf (1).

Microhabitat. Ground.

Remarks. [Ray et al. \(2015\)](#) suggested that agricultural habitat transformation may negatively affect *A. fuliginosa* populations. Similarly, vehicular collisions have been identified as an important source of mortality for amphisbaenians in western Amazonia ([Van der Hoek & Jarrín-V., 2017](#)). Assessing the impact of these threats on *A. fuliginosa* and other fossorial reptiles in Colombia is critical, given the limited scientific knowledge of amphisbaenians in the country, which is primarily restricted to species inventories (e.g., [Torres-Ramírez & Angarita-Sierra, 2022](#)), as is the case in the present study. The only individual recorded was found dead as roadkill on a paved road bordered by a riparian forest.

Suborder Sauria

Family Alopoglossidae

***Alopoglossus festae*** (Peracca, 1896)

Measurements. SVL: female 51.58 mm, males 49.75–57.19 mm (n = 2); TL: female 96.68 mm, males 79.67–91.93 mm (n = 2); weight female (2.6 g), males (range 1.3–3.6 g, n = 2).

Climatic season. Rainy.

Time of records. 19:45–20:11 h.

Habitat. Rf (3), Df (1).

Microhabitat. Leaf litter.

Remarks. The present record for *A. festae* appears to represent the southernmost occurrence of the

species in the Magdalena River basin ([Harris, 1994](#); [Medina-Rangel & López-Perilla, 2014](#)). In contrast to *Loxopholis rugiceps*—another leaf-litter lizard recorded in the same habitat—, *A. festae* may be experiencing population declines associated with forest transformation and regeneration linked to oil palm monocultures. This hypothesis requires testing using additional data from contrasting habitat types across the mMRB.

Family Anolidae

***Anolis auratus*** Daudin, 1802

Measurements. SVL: 42.67 mm; TL: 101.28 mm; weight: 1.7 g.

Climatic season. Dry and rainy.

Time of records. 14:29–22:05 h.

Habitat. Df (3), Rf (19), Sh (40), Sw (7), R (19).

Microhabitat. Soil, leaf litter, leaves, fern branches.

Remarks. With 88 records, *A. auratus* was a common species in the study area and was primarily associated with open habitats, consistent with previous findings for Colombian populations ([Medina-Rangel & Cárdenas-Arévalo, 2015](#)).

***Anolis tropidogaster*** Hallowsell, 1856

Measurements. SVL: females  $46.86 \pm 7.24$  mm (range 37.43–53.37 mm, n = 5), males  $45.67 \pm 5.42$  mm (range 37.27–51.35 mm, n = 6); TL: females  $47.92 \pm 29.50$  mm (range 10.32–89.92 mm, n = 5); males  $60.20 \pm 32.16$  mm (range 22.39–95.62 mm, n = 6); weight: females  $1.97 \pm 0.95$  g (range 1.1–3.3 g, n = 5), males  $2.05 \pm 0.69$  g (range 1.1–2.8 g, n = 6).

Climatic season. Dry and rainy.

Time of records. 14:40–22:32 h.

Habitat. Df (17), Rf (89), Of (4), Sh (2), Sw (2), R (1).

Microhabitat. Leaves, trunks, fern branches.

Remarks. With 116 records, *A. tropidogaster* was the third most abundant species in this study and was primarily associated with forested habitats. [Köhler et al. \(2012\)](#) distinguished *A. gagei* from *A. tropidogaster* based on hemipenial and morphological

characters. Specimens from Puerto Wilches exhibit diagnostic traits consistent with *A. tropidogaster*, including a Type A hemipenis sensu Köhler et al. (2012).

Family Corytophanidae Fitzinger, 1843

***Basiliscus galeritus*** Duméril, 1851

Measurements. SVL: 92.61 mm; TL: 251 mm; weight: 22 g.

Climatic season. Dry and rainy.

Time of records. 14:17–22:15 h.

Habitat. Df (17), Rf (89), Of (4), Sh (2), Sw (2), R (1).

Microhabitat. Leaves, trunks, fern branches, rocks, leaf litter, water.

Remarks. With 171 records, *B. galeritus* was the most common reptile species recorded in Puerto Wilches and was observed across all habitat types. The records included 95 adults, 74 juveniles, and two neonates. Six individuals were observed submerged in creeks; one remained immobile at an approximate depth of one meter for six minutes. Most individuals were found perched on branches and trunks of trees or shrubs within the understory, particularly along the margins of creeks and swamps.

Family Diploglossidae Bocourt (1873)

***Diploglossus monotropis*** (Kuhl, 1820)

Measurements. SVL: 180 mm; TL: 218 mm; weight: 143 g.

Climatic season. Dry and rainy.

Time of records. 15:25–21:09 h.

Habitat. Rf (6).

Microhabitat. Leaf litter.

Remarks. *D. monotropis* was recorded in riparian forests, where individuals were observed within wide crevices formed by tree roots and rocks covered with leaf litter. Although the species was not detected in dense forests during this study, its abundance may be higher in such habitats. Future studies should

evaluate *D. monotropis* responses to forest fragmentation in the mMRB (Díaz-Ayala et al., 2015).

Family Gekkonidae Opperl, 1811

***Hemidactylus frenatus*** Duméril & Bibron, 1836

Measurements. SVL: 49.6 mm; TL: 43.9 mm; weight: 3.2 g.

Climatic season. Dry and rainy.

Time of records. 18:58–19:15 h.

Habitat. R (4).

Microhabitat. Ground, trunks.

Remarks. *H. frenatus* is an exotic and invasive species in South America (Henao-Osorio et al., 2021). In Puerto Wilches, it was recorded exclusively along the margins of paved roads and outside urban areas.

Family Gymnophthalmidae Merrem, 1820

***Bachia bicolor*** (Cope, 1896)

Measurements. SVL: 35.08 mm; TL: 49.97 mm; weight: 0.3 g.

Climatic season. Rainy.

Time of record. 10:05 h.

Habitat. Rf (1).

Microhabitat. Under soil.

Remarks. This fossorial species (Ramos-Pallarés et al., 2017) was detected only during the installation of pitfall traps for coleopterans. Previous studies indicate that *B. bicolor* is highly tolerant of anthropogenic disturbance and occupies a broad range of habitats, from natural to urban environments (Ramos-Pallarés et al., 2017; Díaz et al., 2018).

***Loxopholis rugiceps*** Cope, 1869

Measurements. SVL: females  $34.11 \pm 4.82$  mm (range 30.6–39.6 mm, n = 3), males  $37.70 \pm 1.11$  mm (range 36.5–38.6 mm, n = 3); TL: females  $55.75 \pm 23.40$  mm (range 23.40–78.34 mm, n = 3), males  $75.08 \pm 10.30$  mm (range 67.45–86.79 mm, n = 3); weight: females

1.03 ± 0.50 g (range 0.68–1.6 g, n = 3), males 1.53 ± 0.15 g (range 1.4–1.7 g, n = 3).

Climatic season. Dry and rainy.

Time of records. 15:25–22:41 h.

Habitat. Df (1), Rf (106), Sh (14), R (9).

Microhabitat. Leaf litter, soil, trunk.

Remarks. With 117 records, *L. rugiceps* was the second-most abundant species in this study. High abundances of *L. rugiceps* have also been reported in fragmented dry forests in northern Colombia (Atencia et al., 2020). These observations suggest that this species may be favored by environmental conditions associated with forest fragmentation (Urbina-Cardona et al., 2006; Atencia et al., 2020).

Family Iguanidae Oppel, 1811

***Iguana iguana*** (Linnaeus, 1758)

Climatic season. Dry and rainy.

Time of records. 14:45–19:55 h.

Habitat. Sw (5), Sh (2).

Microhabitat. Leaves, shrub branches.

Remarks. This was the only lizard species strictly associated with swamp habitats in the study area. *I. iguana* is widely used by local communities in Puerto Wilches and throughout the Lower Magdalena River Basin. Population declines of up to 80% over the last 30 years have been attributed to the harvesting of meat and eggs (Palacio et al., 1999; Martínez & Gómez, 2013). This decline may partially explain the low abundance observed in this study (n = 7).

Family Phyllodactylidae Gamble, Bauer, Greenbaum & Jackman, 2008

***Thecadactylus rapicauda*** (Houttuyn, 1782)

Measurements. SVL: 94 mm; TL: 70 mm; weight: 16 g.

Climatic season. Rainy.

Time of records. 19:45–20:11 h.

Habitat. Rf (3), Df (1).

Microhabitat. Trunks.

Remarks. The abundance of *T. rapicauda* has been reported to be positively correlated with forest stratification in dry forests of the lower Magdalena River Basin (Medina-Rangel & Cárdenas-Arévalo, 2015). In contrast, western Amazonian populations are more abundant in deforested areas and near buildings, whereas eastern Amazonian populations are primarily associated with forested habitats (Vitt & Zanni, 1997). All four individuals recorded in Puerto Wilches were found within forested habitats (riparian and dense forests) and were active after dusk.

Family Scincidae Gray, 1825

***Mabuya* sp. IV sensu** Pinto-Sánchez et al. (2015)

Measurements. SVL: females 89.59 ± 87.82 mm (range 78.43–100 mm, n = 3); TL: females 124.9 (range 87.82–162 mm, n = 2); weight: females 15.15 ± 12.1 g (range 9.3–21 g, n = 3).

Climatic season. Dry and rainy.

Time of records. 14:44–22:20 h.

Habitat. Rf (n), Sh (5), R (2).

Microhabitat. Leaf litter, ground.

Remarks. Specimens were assigned to *Mabuya* sp. IV based on their phylogenetic placement among lineages from the low and middle Magdalena River Basin, Colombia, sensu Pinto-Sánchez et al. (2015).

Family Sphaerodactylidae Underwood, 1954

***Gonatodes albogularis*** (Duméril & Bibron, 1836)

Measurements. SVL: females 34.92 ± 27.18 mm (range 26.98–41.92 mm, n = 5), males 41.09 ± 245.2 mm (range 38,88–43.3 mm, n = 4); TL: females 33.36 ± 11.85 mm (range 27.44–38.36 mm, n = 3), males 35.58 ± 11.07 mm (range 33.7–56.25 mm, n = 4); weight: females 1.18 ± 1.2 g (range 0.6–1.8 g, n = 5), males 1.95 ± 0.8 g (range 1,3–2,3 g, n = 4).

Climatic season. Dry and rainy.

Time of records. 10:12–22:32 h.

Habitat. Rf (98), Of (1), Df (19), Sh (4), Pa (1), R (10).

Microhabitat. Leaf litter, trunks, tree branches.

Remarks. *G. albogularis* is a dominant species in tropical dry forest fragments, where it may comprise up to 65 % of total assemblage abundance (Carvajal-Cogollo & Urbina-Cardona, 2008; Medina-Rangel & Cárdenas-Arévalo, 2015). Its high abundance has been attributed to generalist habits and year-round reproductive activity (Serrano-Cardozo et al., 2007). With 133 records, *G. albogularis* was among the most abundant species in this study, occurring primarily in riparian and dense forests. Up to five individuals (both males and females) were observed in a single tree. Territorial interactions between males were also observed in situ, exhibiting behaviors comparable to those described for captive individuals by Martínez-Cotrina et al. (2014).

***Lepidoblepharis* aff. *xanthostigma***

Measurements. SVL:  $41.67 \pm 24.41$  mm (range 25.49–77.02 mm, n = 6); TL:  $41.12 \pm 23.89$  (range 17.13–78.19 mm, n = 6); weight  $0.46 \pm 0.05$  (range 0.4–0.5 g, n = 6).

Climatic season. Dry and rainy.

Time of records. 15:27–20:33 h.

Habitat. Rf (21).

Microhabitat. Leaf litter, ground, trunks.

Remarks. Specimens of *Lepidoblepharis* aff. *xanthostigma* from Puerto Wilches are morphologically similar to individuals from the Carare-Opón and Lebrija river basins, in Santander, Colombia (Ayala & Castro, 1983), as well as to populations reported from Panama (Batista et al., 2015). However, Batista et al. noted that “the distribution of *L. xanthostigma* as inferred herein implies the absence of this species from Colombia, meaning that the long-toed specimens with granular dorsals reported as *L. xanthostigma* from Colombia (Ayala & Castro, 1983) should represent a different species whose identity remains to be clarified” (2015: 208). Considering this interpretation, specimens from Puerto Wilches are referred to herein as *L. aff. xanthostigma*.

***Lepidoblepharis* sp.**

Measurements. SVL: 31.7 mm; TL: 26.93 mm; weight: 0.8 g.

Climatic season. Rainy.

Time of record. 18:50 h.

Habitat. Rf (1).

Microhabitat. Leaf litter.

Remarks. A single individual was recorded in a riparian forest, moving through leaf litter during the evening. Its morphological characteristics, including meristic counts and coloration patterns, differ from those of other lowland species of *Lepidoblepharis* (e.g., *L. columbianus* and *L. xanthostigma*) as from those of the Andean species *L. duolepis*. Molecular analyses will be necessary to clarify the taxonomic identity and phylogenetic placement of this rare species.

***Sphaerodactylus lineolatus* Lichtenstein & Martens, 1856**

Measurements. SVL:  $31.57 \pm 0.93$  mm (range 30.98–32.65 mm, n = 3); TL:  $18.58 \pm 7.77$  mm (range 12.07–27.18 mm, n = 3); weight:  $0.6 \pm 0.1$  g (range 0.5–0.7 g, n = 3).

Climatic season. Dry and rainy.

Time of records. 15:01–17:15 h.

Habitat. Rf (5), Df (1).

Microhabitat. Leaf litter, trunks.

Remarks. Dwarf geckos of the genus *Sphaerodactylus* have frequently been misidentified in Colombia due to their small body size and shared coloration patterns, as well as the lack of comprehensive taxonomic revisions of collected material (Grisales-Martinez & Rendon-Valencia, 2014). Specimens from Puerto Wilches were identified based on meristic and coloration characters outlined by Harris (1982), Savage (2002), and Grisales-Martinez and Rendon-Valencia (2014). All individuals were recorded at the base of trees during daylight hours, primarily in forested habitats. *Sphaerodactylus lineolatus* appears to be an uncommon species in Puerto Wilches; despite intensive searches of leaf litter at the base of

selected trees, fewer individuals were detected compared to other small, syntopic geckos such as *Gonatodes albogularis* and *Lepidoblepharis* aff. *xanthostigma*.

Family Teiidae Gray, 1827

***Ameiva bifrontata*** Cope, 1862

Measurements. SVL: 89.35 mm; TL: 191 mm; weight: 14.5 g.

Climatic season. Rainy.

Time of records. 14:45–16:53 h.

Habitat. Rf (1), Pa (1), R (2).

Microhabitat. Leaf litter, ground.

Remarks. This species is abundant in open, dry, and semi-desert environments of northern South America (Acuña-Vargas, 2016) but was rarely recorded in Puerto Wilches. Data from biological collections suggest that it is also uncommon in the mMRB (SiB-Colombia). We hypothesize that *A. bifrontata* may benefit from the clearing of tropical rainforests, which could facilitate its southward expansion within the Magdalena River basin. Our report represents the first known record for the Department of Santander (see Meneses-Pelayo, 2024).

***Cnemidophorus gr. lemniscatus***

Climatic season. Dry and rainy.

Time of records. 14:50–15:34 h.

Habitat. Sh (4), Pa (4), R (2).

Microhabitat. Leaf litter, ground.

Remarks. This species complex is among the most conspicuous and dominant lizards in the lowlands of the Magdalena River basin, particularly in the Caribbean region (Acuña-Vargas, 2016). McCranie & Hedges (2013) proposed that *gaugei* and other forms (e.g., *Cnemidophorus lemniscatus splendidus* and *C. l. espeuti*) be elevated to whole species. They emphasized the need for molecular studies of Colombian and other South American populations. As no specimens were collected during this study, and following the taxonomic considerations of McCranie

& Hedges (2013), individuals from Puerto Wilches are herein referred to as *Cnemidophorus gr. lemniscatus*. In Puerto Wilches, this taxon was recorded in open habitats and along roadsides. Detailed information on the geographic distribution and ecology of this species complex in Colombia is provided by Grisales-Martínez & Rendón-Valencia (2014).

***Holcosus festivus*** (Lichtenstein & Martens, 1856)

Measurements. SVL: female 62.91 mm, male 43.88 mm; TL: female 78.27 mm, male 100 mm; weight: female 7.0 g; male 2.3 g.

Climatic season. Dry and rainy.

Time of records. 14:53–22:44 h.

Habitat. Rf (5), Df (1), Pa (1).

Microhabitat. Leaf litter, ground.

Remarks. This species is conspicuous in humid forests along the Magdalena River. Medina-Rangel & Cárdenas-Arévalo (2015) reported a positive relationship between tree density and the abundance of *H. festivus*. Marín-Martínez et al. (2017) documented predation on *H. festivus* by the snake *Oxyrhopus petolarius* in the mMRB.

***Tupinambis* sp.**

Climatic season. Dry.

Time of record. 15:39 h.

Habitat. Sh (1).

Microhabitat. Ground.

Remarks. The individuals recorded in Puerto Wilches may correspond to *Tupinambis cryptus* Murphy, Jowers, Lehtinen, Charles, Colli, Peres Jr., & Hendry Pyron, 2016. However, the lack of collected specimens precludes assignment to a species with certainty.

Order Squamata

Suborder Serpentes

Family Anomalepididae

***Liotyphlops bondensis*** (Griffin, 1916)

Measurements. SVL: 89 mm; TL: 3.37 mm.

Climatic season. Rainy.

Time of record. 18:38 h.

Habitat. Sh (1).

Microhabitat. Ground.

Remarks. *Liotyphlops bondensis* was the only fossorial snake species recorded in this study. Although it was previously considered a synonym of *L. albirostris*, it was recently resurrected as a valid species by [Linares-Vargas et al. \(2021\)](#).

Family Boidae

***Corallus ruschenbergerii* (Cope, 1875)**

Measurements. SVL: female 1046 mm, male 425 mm; TL: female 272 mm, male 110 mm; weight: female 276 g, male 17.8 g.

Climatic season. Dry and rainy.

Time of records. 18:30-22:00 h.

Habitat. Rf (9), Df (1), Sh (2).

Microhabitat. Palm oil leaves, tree leaves, tree and shrub branches.

Remarks. *C. ruschenbergerii* is widely distributed in northern South America and Lower Central America, where it preys on a variety of ectothermic and endothermic species ([Henderson & Pauers, 2012](#); [Acevedo-Charry & Caicedo-Portilla, 2016](#)). This species was relatively common in Puerto Wilches. We recorded three individuals (two adults and one juvenile) in a single tree more than 5 m above the ground. Additionally, three individuals were observed on oil palm leaves at the edge of riparian forests, at heights exceeding 10 m.

***Epicrates maurus* Gray, 1849**

Measurements. SVL: 1114 mm; TL: 130 mm; weight: 780 g.

Climatic season. Rainy.

Time of record. 22:14 h.

Habitat. R (1).

Microhabitat. Ground.

Remarks. Only one individual was recorded crossing a paved road. [Salazar-Guzmán et al. \(2022\)](#) identified a *Zygodontomys brevicauda* mouse as prey for this individual.

Family Colubridae

***Atractus* sp.**

Measurements. SVL: 286 mm; TL: 25 mm; weight: 9.8 g.

Climatic season. Rainy.

Time of record. 21:15 h.

Habitat. Rf (1).

Microhabitat. Leaf litter.

Remarks. The *Atractus* genus is widely distributed and highly diverse in the northern Andes. Previous studies have helped define species boundaries in the Magdalena River basin, particularly in montane areas above 1,200 m a.s.l. ([Passos & Lynch, 2010](#); [Meneses-Pelayo & Passos, 2019](#)). However, the species recorded in Puerto Wilches (60 m a.s.l.) likely corresponds to an undescribed taxon. We therefore refrain from assigning a specific identity until it is validated by DNA-based evidence. The individual shares meristic and morphological characteristics similar to those of *Atractus fuliginosus* (Hallowell, 1845), a species distributed in the cis-Andean region. The only recorded individual was observed moving through leaf litter along the edge of a small stream.

***Chironius spixi* (Hallowell, 1845)**

Measurements. SVL: male 632 mm, undetermined sex 272 mm; TL: male 308 mm, undetermined sex 130 mm; weight: male 70 g.

Climatic season. Dry.

Time of records. 15:11–21:43 h.

Habitat. Rf (3), Sh (1), R (2).

Microhabitat. Ground, tree branches.

Remarks. This fast-moving, semiarboreal snake has an amphibian-based diet ([Dixon et al., 1993](#)). We

observed *C. spixi* moving on shrubs and tree branches during the afternoon and resting in riparian forests at dusk. Despite being one of the most conspicuous snake species in the lowlands of Colombia and Venezuela (Rivas et al., 2012), *C. spixi* remains poorly studied.

***Clelia clelia*** (Daudin, 1803)

Measurements. SVL: 370 mm; TL: 90.5 mm; weight: 16 g.

Climatic season. Dry

Time of records. 22:32–22:37 h.

Habitat. Rf (1), Sh (1).

Microhabitat. Leaf litter, leaf.

Remarks. *Clelia clelia* is one of the largest snakes in the rainforests of the mMRB and, in general, the Neotropics (Martins & Oliveira, 1998; Savage, 2002; Diaz-Ricaurte et al., 2018a). Its diet is primarily composed of other snakes, including medically important species of the genera *Bothrops*, *Porthidium*, and *Micrurus* (Delia, 2009; Solórzano & Sassa, 2018). Despite being relatively common in forested areas below 1,500 m a.s.l., only two individuals were recorded during this study. Local villagers reported that juveniles are often killed because their aposematic coloration (red body and black head with a white nuchal collar) leads them to be mistaken for venomous species (see Lynch, 2012, for a discussion).

***Dendrophidion percarinatum*** (Cope, 1893)

Measurements. SVL: females 648 and 625 mm; TL: females 410 and 394 mm; weight: females 76 and 82 g.

Climatic season. Dry.

Time of records. 20:15–22:27 h.

Habitat. Rf (2), Of (1).

Microhabitat. Tree branches, Fern branches.

Remarks. *Dendrophidion percarinatum* is widely distributed in Central America but exhibits more scattered populations in South America. Cadle (2012) examined specimens from western Colombia and

Ecuador and assigned them to *D. percarinatum* while also describing two new species and recognizing the *Dendrophidion percarinatum* species complex (Cadle, 2012). This complex represents one of the most taxonomically intriguing taxa in the mMRB and requires a comprehensive revision. For the purposes of this study, and to maintain nomenclatural stability, specimens from Puerto Wilches are classified as *D. percarinatum*. We recorded three individuals (two adult females and one juvenile) perched on shrub branches along stream margins at night.

***Dryophylax gambotensis*** (Pérez-Santos & Moreno, 1989)

Measurements. SVL: male 450 mm; TL: 141 mm; weight: 23 g.

Climatic season. Dry and rainy.

Time of records. 20:02–22:03 h.

Habitat. Of (1), Sh (4), Sw (1), Pa (1), R (1).

Microhabitat. Shrub branches and low vegetation.

Remarks. This endemic species is restricted to the low Magdalena River basin (Bailey & Thomas, 2007) and is primarily associated with open habitats near lentic water bodies, where it forages at dusk and at night. Medina-Rangel & Cárdenas-Arévalo (2015) reported a positive relationship between *D. gambotensis* abundance and precipitation. Puerto Wilches represents the southernmost known locality for this species (Bailey & Thomas, 2007).

***Enuliophis sclateri*** (Boulenger, 1894)

Measurements. SVL: females 230 and 279 mm (n = 2), males  $112.17 \pm 30.4$  mm (range 26.5–186 mm, n = 3); TL: females 111 and 87 mm (n = 2), males  $64.6 \pm 33$  mm (range 20–106 mm, n = 3); weight: females 8,7 and 13 g (n = 2), males  $6.33 \pm 5.94$  g (range 1.6–13 g, n = 3).

Climatic season. Dry and rainy.

Time of records. 19:35–21:57 h.

Habitat. Df (3), Rf (2).

Microhabitat. Leaf litter.

Remarks. This is the only species in the genus *Enuliophis* (McCranie & Villa, 1993) and one of the rarest and least documented snake species in Colombia. In Puerto Wilches, all individuals were active at night and were observed moving on a thick (> 30 cm) layer of leaf litter within forested areas. We therefore infer that deforestation may negatively affect the local population of *E. sclateri* in Puerto Wilches.

***Erythrolamprus melanotus*** (Shaw, 1802)

Climatic season. Dry.

Time of record. 19:55 h.

Habitat. R (4), Sh (1).

Microhabitat. Ground.

Remarks. All specimens were salvaged from roadkill on paved roads, except IAvH-R-9752. Consequently, the three individuals collected for this study were in poor condition due to vehicular impact.

***Helicops danieli*** Amaral, 1938

Measurements. SVL: females 764 and 237 mm (n = 2), males 244 and 370 mm (n = 2), neonates  $172.2 \pm 6.69$  mm (range 172–189 mm, n = 10); TL: females 203 and 89 mm (n = 2), males 86 and 105 mm (n = 2), neonates  $57.2 \pm 6.82$  (range 51–66 mm, n = 10); weight: females 234 and 10.4 g (n = 2), males 10.3 and 35 g (n = 2), neonates  $6.03 \pm 0.34$  g (range 5.6–6.8 g, n = 10).

Climatic season. Dry and rainy.

Time of records. 20:00–21:55 h.

Habitat. Rf (9).

Microhabitat. water.

Remarks. *Helicops danieli* is an aquatic species endemic to the Atrato and Magdalena River basins (Hurtado-Gómez et al., 2024). Two specimens (IAvH-R 9683, 9686) were salvaged from road mortality on paved roads. Additionally, a gravid adult female (IAvH-R 9726) was collected, which deposited ten neonates one day post-capture. Nocturnal foraging behavior was observed along creek margins; individuals exhibited searching patterns, investigating crevices and rocky substrates.

***Imantodes cenchoa*** (Linnaeus, 1758)

Measurements. SVL: males 255 and 660 mm; TL: males 100 and 292 mm; weight: males 1.7 and 11 g.

Climatic season. Dry and rainy.

Time of records. 15:10–22:57 h.

Habitat. Rf (23), Of (2), Df (2), Sh (4), R (2).

Microhabitat. Leaves and tree branches, fern branches, leaf litter.

Remarks. *I. cenchoa* was the most abundant species recorded in this study (n = 32). This taxon is among the most conspicuous snake species in low- and mid-elevation ecosystems, where it primarily predate on lizards and anurans (Martins & Oliveira, 1998; Savage, 2002; Rojas-Morales et al., 2021).

***Leptodeira annulata*** (Linnaeus, 1758)

Measurements. SVL: female 547 mm, males 64.21 and 40.5 mm (n = 2); TL: female: 164 mm, males 17.5 and 14.7 mm (n = 2); weight: female 47 g, males 29.5 and 14 g (n = 2).

Climatic season. Dry and rainy.

Time of records. 15:25–23:02 h.

Habitat. Rf (22), R (3).

Microhabitat. Leaf litter, soil.

Remarks. *Leptodeira annulata* is an opisthoglyphous species; a documented case of human envenomation in northern Colombia was provided by Angarita-Sierra et al. (2020). This taxon is broadly distributed across northern South America to Brazil, occurring at elevations from sea level to 1,000 m a.s.l. During this study, individuals were observed active at night on the ground along the margins of riparian forests. In Puerto Wilches, this species is frequently killed by local inhabitants due to its morphological resemblance to the pit viper *Bothrops asper* (locally known as “mapaná”).

***Leptophis occidentalis*** (Günther, 1859)

Measurements. SVL: females 544 and 837 mm (n = 2), males  $728.33 \pm 54.22$  mm (range 668–773 mm, n = 3); TL: females 350 and 495 mm (n = 2), males  $447.33 \pm 28$  mm (range 415–464 mm, n = 3); weight: females

21 and 83 g (n = 2), males  $48,93 \pm 1,67$  g (range 47–50 g, n = 3).

Climatic season. Dry and rainy.

Time of records. 19:10–21:30 h.

Habitat. Rf (7), Sw (2).

Microhabitat. Shrub branches.

Remarks. Following the taxonomic revision by [Albuquerque & Fernandes \(2022\)](#), trans-Andean populations of *Leptophis*—including those inhabiting Colombian inter-Andean valleys—are now assigned to *L. occidentalis*. This taxon was previously treated as a subspecies of *L. ahaetulla*. In the study area of Puerto Wilches, all recorded individuals were observed at night resting on low vegetation, primarily along the margins of riparian forests.

***Lygophis lineatus*** (Linnaeus, 1758)

Measurements. SVL: 135 mm; TL: 47 mm; weight: 0.8 g.

Climatic season. Dry and rainy.

Time of records. 16:21–17:12 h.

Habitat. Rf (1), R (1).

Microhabitat. Ground.

Remarks. *Lygophis lineatus* is a medium-sized colubrid broadly distributed across northern South America ([Michaud & Dixon, 1987](#)). This euryoic species primarily consumes anurans ([Medina-Rangel & Cárdenas-Arévalo, 2015](#)). In Puerto Wilches, only two individuals were recorded, suggesting the species is locally uncommon; this contrasts with higher abundance levels reported in other regions of the lower Magdalena River basin and the Guajira Peninsula ([Acuña-Vargas, 2016](#); [Carvajal-Cogollo et al., 2020](#)).

***Mastigodryas boddaerti*** (Santzen, 1796)

Measurements. SVL: males 699 and 700 mm. TL: males 281 and 289 mm. Weight: males 81 and 131 g.

Climatic season. Dry and rainy.

Time of records. 20:09–21:35 h.

Habitat. Rf (3).

Microhabitat. Leaf litter, shrub branches.

Remarks. *Mastigodryas boddaerti* is a terrestrial racer snake inhabiting open areas across northern South America and several offshore islands ([Siqueira et al., 2012, 2013](#)). On Gorgona Island, this species reportedly dominates anthropogenically altered (cropped) areas during the dry season ([Urbina-Cardona et al., 2008](#)). In the current study, we recorded only three adult individuals, one of which was found as a road-mortality on a paved surface.

***Mastigodryas pleei*** (Duméril, Bibron & Duméril, 1854)

Climatic season. Dry and rainy.

Time of record. 08:17 h.

Habitat. R (1).

Microhabitat. Leaf litter, shrub branches.

Remarks. The single specimen was salvaged in poor condition as road-mortality.

***Oxybelis aeneus complex*** (Wagler, 1824)

Measurements. SVL: 359 mm; TL: 241 mm; weight: 5 g.

Climatic season. Dry.

Time of record. 21:20 h.

Habitat. Rf (1), R (1).

Microhabitat. Tree branches.

Remarks. The *Oxybelis aeneus* complex represents a classic case of Neotropical cryptic diversity ([Jadin et al., 2020, 2021](#); [Torres-Carvajal et al., 2021](#)). While [Jadin et al. \(2020\)](#) restricted *O. aeneus* to Amazonian populations and [Torres-Carvajal et al. \(2021\)](#) described *O. transandinus* for western Ecuadorian populations, Colombian trans-Andean populations remain unassigned as they were excluded from these recent phylogenetic analyses. Consequently, we refer the Puerto Wilches population to the *O. aeneus* complex pending a robust integrative revision. We recorded only two individuals: one was found syntopically in a tree with *Leptophis occidentalis*, and the second was salvaged as road-mortality.

***Oxyrhopus petolarius*** (Linnaeus, 1758)

Measurements. SVL: 48.2 mm; TL: 13 mm; weight: 3.1 g.

Climatic season. Dry and rainy.

Time of record. 18:41 h.

Habitat. Sh (1).

Microhabitat. Ground.

Remarks. *Oxyrhopus petolarius* is a frequent inhabitant of the Magdalena Basin lowlands and across Colombia (Lynch, 2009). Despite its regional commonness, only a single individual was recorded in Puerto Wilches. The feeding habits of *O. petolarius* in the mMRB include lizards such as *H. festivus* (Marín-Martínez et al., 2017) and rodents like *Proechimys chrysaolus* (Serna-Botero et al., 2019).

***Pseudoboa newwiedii*** (Duméril, Bibron & Duméril, 1854)

Measurements. SVL: females 582.33 ± 31.56 mm (range 552–615 mm, n = 3); TL: females 214.00 ± 19.92 mm (range 191–226 mm, n = 3); weight: females 90.0 ± 26.22 g (range 66–118 g, n = 3).

Climatic season. Dry and rainy.

Time of records. 18:49–22:29 h.

Habitat. Rf (3), Pa (2).

Microhabitat. Leaf litter.

Remarks. *Pseudoboa newwiedii* is a ubiquitous taxon widely distributed across northern South America, including the continental islands of Trinidad and Tobago. In Colombia, it occurs across all natural regions below 1,000 m a.s.l. (Lozano & Angarita-Sierra, 2018). While Medina-Rangel & Cárdenas-Arévalo (2015) found that abundance in the Zapatos swamp system was positively correlated with tree diameter and herbaceous cover—and negatively correlated with anthropic intervention—, our findings align with those of Vargas-Salinas & Aponte-Gutiérrez (2016). Specifically, we recorded individuals in open habitats in Puerto Wilches. In Puerto Wilches, *P. newwiedii* was the only snake species documented within pastures.

***Stenorrhina degenhardtii*** (Berthold, 1846)

Climatic season. Dry.

Time of record. 09:25 h.

Habitat. R (1).

Microhabitat. Ground.

Remarks. *Stenorrhina degenhardtii* is widely distributed across the Neotropics, ranging from southeastern Mexico to northern South America at elevations from sea level to 2,000 m a.s.l. (Savage, 2002; Acuña-Vargas et al., 2018). Species within the genus *Stenorrhina* (*S. degenhardtii* and *S. freminvillei*) are notable for their specialized diet, which primarily consists of arachnids such as tarantulas and scorpions (Savage, 2002; Solórzano, 2004). Records of *S. degenhardtii* are scarce within Colombia, particularly in the mMRB (Moreno-Arias et al., 2008), where its natural history remains poorly documented. In the current study, we recorded a single individual salvaged as road-mortality.

***Tantilla melanocephala*** (Linnaeus, 1758)

Measurements. SVL: male 173 mm; TL: 60 mm; weight: 2.2 g.

Climatic season. Dry and rainy.

Time of records. 15:49–21:02 h.

Habitat. Rf (1), Sh (1), R (3).

Microhabitat. Leaf litter, ground.

Remarks. *Tantilla melanocephala* is among the most widely distributed serpents in the Neotropics, ranging from Mexico to Argentina at elevations from sea level to 2,700 m a.s.l. This taxon exhibits substantial variation in color patterns and meristic characters, prompting several taxonomic and systematic revisions in recent decades (Savage, 2002; Greenbaum et al., 2004). It is a small, semifossorial species with specialized diet consisting primarily of myriapods (Carvajal-Campos & Rodríguez-Guerra, 2013). In the study area, we recorded six individuals, three of which were recovered as road-mortality on paved roads.

Family Elapidae Boie, 1827

***Micrurus camilae*** Rengifo & Lündberg, 2003

Climatic season. Dry.

Time of records. 7:00–9:00 h.

Habitat. R (2).

Microhabitat. Ground.

Remarks. We recorded only two individuals of this elusive species, both recovered as road-mortality. These records, along with those from the municipalities of Barrancabermeja and Betulia (Meneses-Pelayo & Caballero, 2019), confirm the presence of *M. camilae* within the middle and lower Magdalena River basin. Given its restricted geographic range, susceptibility to habitat transformation, and mortality from vehicular impact and intentional killing, we emphasize the urgent need for targeted monitoring. This taxon is likely to face a significant extinction risk due to these anthropogenic pressures.

***Micrurus dumerilii*** (Jan, 1858)

Measurements. SVL: 490 mm; TL: 53 mm; weight: 24 g.

Climatic season. Dry.

Time of records. 19:45–20:11 h.

Habitat. Rf (1), R (1), Sh (1).

Microhabitat. Leaf litter.

Remarks. *Micrurus dumerilii* is among the most frequent coral snake species in the Magdalena River basin and the broader trans-Andean region (Roze, 1996). The maximum recorded size for this species— a female with SVL of 858 mm and TL of 96 mm— originates from the mMRB (Meneses-Pelayo & Caicedo-Portilla, 2015). Its diet in the mMRB consists primarily of limbless prey, including *Caecilia thompsoni* (Herrera-Lopera et al., 2018). Despite its regional abundance, this species was infrequently encountered in the current study (n = 3). Individuals were observed active at night on the ground, with one specimen salvaged as road-mortality.

Family Viperidae Oppel, 1811

***Bothrops asper*** (Garman, 1883)

Measurements. SVL: 474 mm; TL: 55 mm; weight: 37 g.

Climatic season. Dry.

Time of records. 19:05–22:07 h.

Habitat. Rf (7).

Microhabitat. Leaf litter, soil.

Remarks. Given its medical importance, *Bothrops asper* is among the most extensively studied Neotropical snakes in terms of its biology, natural history, and epidemiology (Campbell & Lamar, 2004, and references therein). Within the mMRB, this species inhabits nearly all habitats (except semi desertic areas) and it is commonly found below 1,300 m a.s.l., even in proximity to buildings and rural regions (Díaz-Ricaurte et al., 2018b). In Puerto Wilches, we recorded five adults and two juveniles exclusively within riparian forests during the dry season.

***Porthidium lansbergii*** (Schlegel, 1841)

Measurements. SVL: males 232 and 169 mm; TL: 28 and 22 mm; weight: 11.7 and 4.0 g.

Climatic season. Dry and rainy.

Time of records. 18:42–22:10 h.

Habitat. Rf (2).

Microhabitat. Leaf litter, ground.

Remarks. *Porthidium lansbergii* is a small pit viper (total length < 800 mm) currently characterized by a wide morphological variation and a contentious taxonomic status, pending a comprehensive integrative revision (Molina-Betancourth et al., 2018). It is broadly distributed across tropical moist and dry forests from lower Central America to northern South America, occurring from sea level to 1,270 m a.s.l. (Campbell & Lamar, 2004). Despite being considered locally abundant in many forested habitats, only two individuals were recorded in a riparian forest in Puerto Wilches, one of which was observed within a root crevice. Furthermore,

although documented as potentially aggressive when disturbed (Campbell & Lamar, 2004), the individuals encountered in this study remained docile during handling and photography.

Order Testudines

Suborder Cryptodira

Family Emydidae

***Trachemys callirostris*** (Gray, 1855)

Climatic season. Dry.

Time of records. 15:30–19:09 h.

Habitat. Rf (1), Sh (1).

Microhabitat. Underwater in creeks and small streams.

Remarks. The taxonomy of *T. callirostris* has been stabilized in recent decades (Restrepo et al., 2014), with two recognized subspecies: *T. c. callirostris* and *T. c. chichiriviche*. These inhabit the Magdalena and Maracaibo Lake basins of northern South America (Colombia and Venezuela), respectively. This turtle prefers shallow lotic water bodies and maintains an omnivorous diet. In the Depresión Momposina and the mMRB, nesting occurs between December and May and July and August (Bock et al., 2012). In Puerto Wilches, we recorded only two individuals, although local inhabitants report that the species is common. The taxon is significantly threatened by illegal trade, nest destruction, and other anthropogenic pressures (Bock et al., 2012; Restrepo et al., 2014).

Family Geoemydidae

***Rhinoclemmys melanosterna*** (Gray, 1861)

Climatic season. Dry and rainy.

Time of records. 16:00–20:47 h.

Habitat. Rf (6), Sh (1).

Microhabitat. Leaf litter underwater.

Remarks. This species inhabits various lotic and lentic systems—including rivers, streams, marshes, and lagoons—across northwestern South America,

spanning both rainforest and dry forest biomes (Corredor-L. et al., 2007). It is primarily herbivorous (Medem, 1962), with oviposition occurring year-round, albeit with seasonal fluctuations (Echeverry-García et al., 2012). Within the mMRB, it has been reported on marsh margins and connecting channels, often sheltering beneath dense aquatic vegetation (Echeverry-García et al., 2012). In Puerto Wilches, we recorded seven individuals across diverse microhabitats: five on muddy creek substrates—blending in with rocks and covered with mud—, one in ponds, and one on leaf litter moving on the ground at the riparian margin. Local inhabitants indicated that this species is frequently harvested for human consumption.

Family Kinosternidae

***Kinosternon scorpioides*** (Linnaeus, 1766)

Climatic season. Dry and rainy.

Time of records. 16:50–21:20 h.

Habitat. Rf (7).

Microhabitat. Leaf litter underwater.

Remarks. This is the most widely distributed turtle in the Neotropics, inhabiting both lentic and lotic systems, including brackish water. It exhibits a preference for dystrophic (dark-water) habitats with muddy substrates, isolated from primary river channels (Pritchard & Trebbau, 1984; Montes-Correa et al., 2017). In Puerto Wilches, we recorded seven individuals (three females, three males, and one of undetermined sex). Notably, four of these individuals were observed during a single 20-minute interval (March 22, 2022; 21:00–21:20 h) moving underwater in a shallow creek (depth < 0.2 m).

Order Crocodylia

Family Alligatoridae

***Caiman crocodilus*** (Linnaeus, 1758)

Climatic season. Dry and rainy.

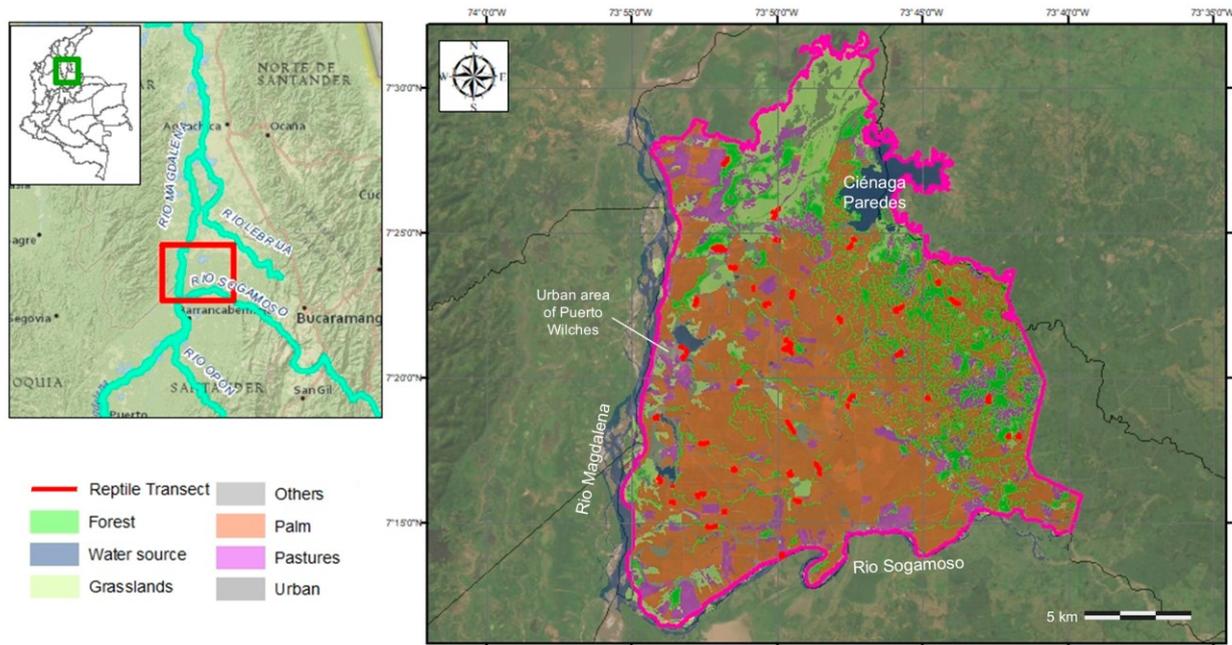
Time of records. 15:21–21:30 h.

Habitat. Rf (16), Df (1), Sh (35), Sw (51).

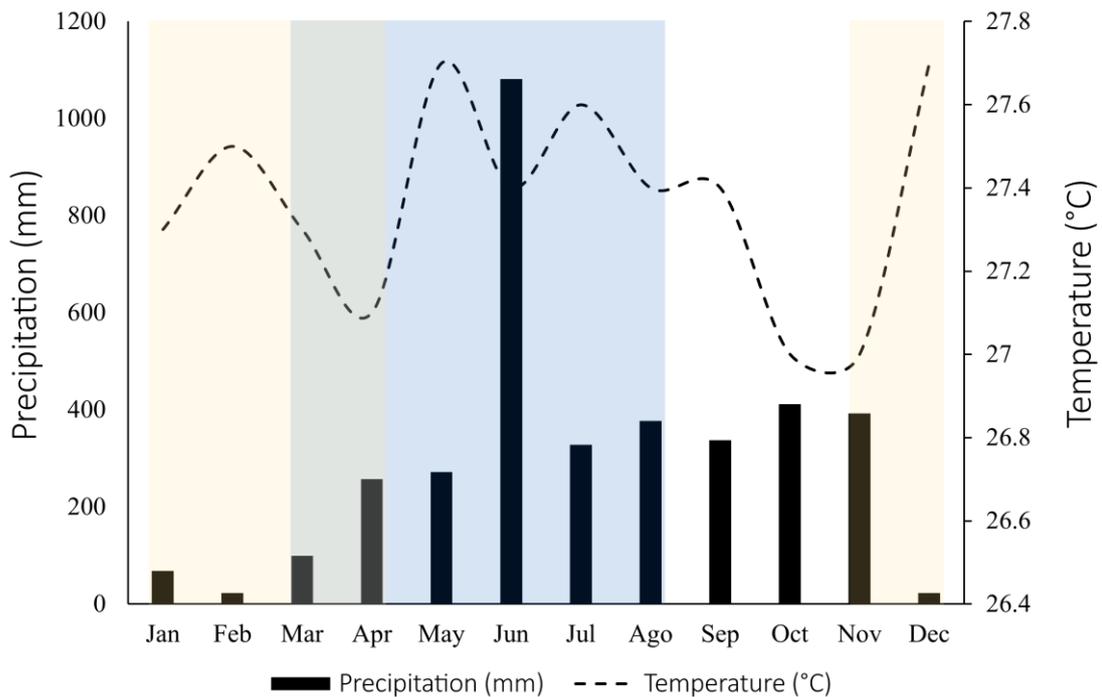
Microhabitat. Ground, underwater of streams and swamps.

Remarks. *Caiman crocodilus* was the most common aquatic reptile recorded, with 103 individuals observed through the study period. This species was primarily associated with riparian and swamp habitats, though individuals were occasionally observed traversing paved roads. Hunting for local consumption remains a significant threat to the *C. crocodilus* population in Puerto Wilches.

**Figure 1.** Map of the study area depicting sampling points (red lines) where non-avian reptiles were surveyed in the municipality of Puerto Wilches, Santander, Colombia



**Figure 2.** Climadiagram of the study area for the period 2020–2023, showing mean monthly precipitation and air temperature; B)



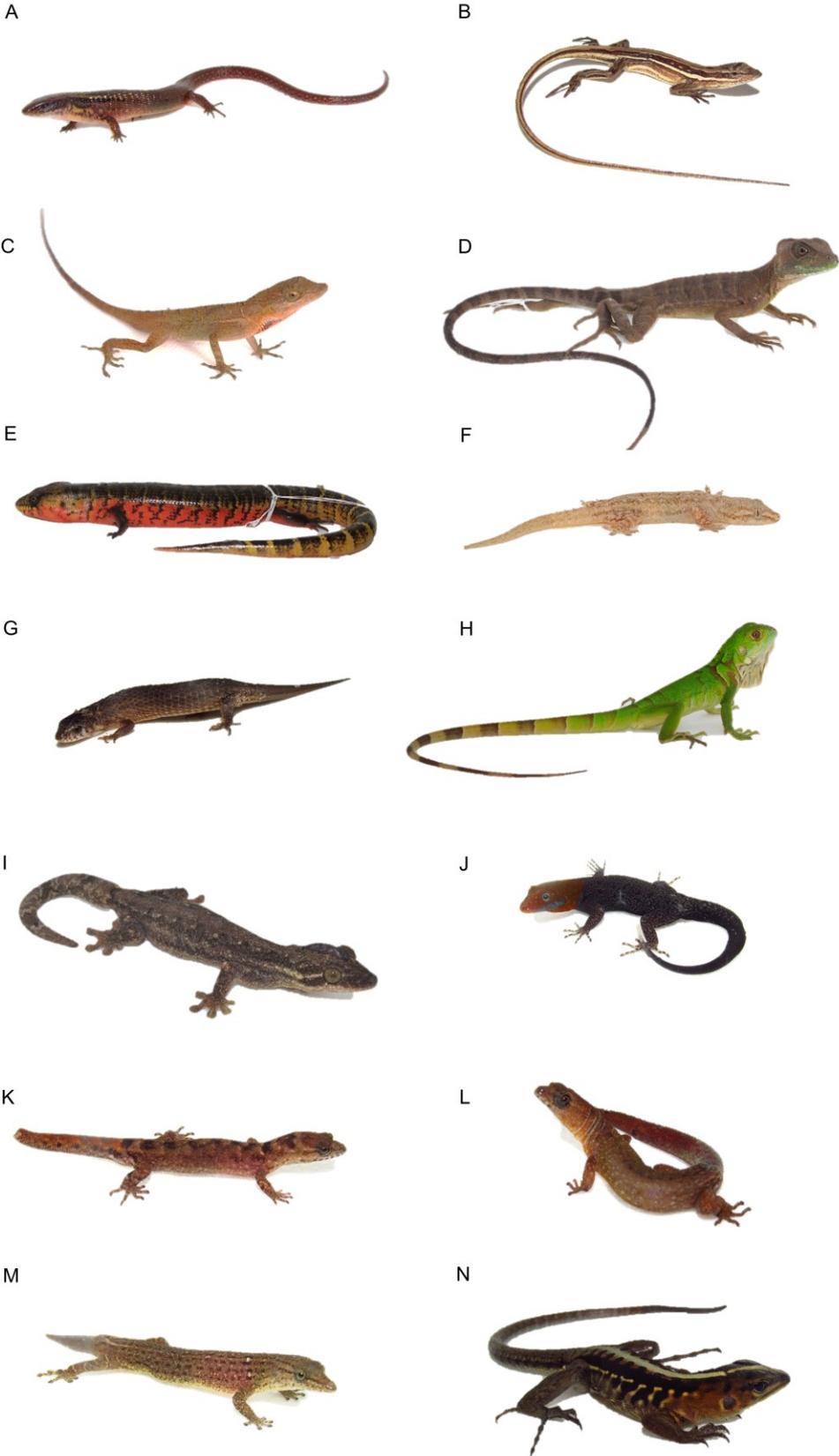
Note. Source: Data source: DHIME (Datos Hidrometeorológicos, IDEAM, Colombia). The light-blue shading indicates the fieldwork period, and the light-yellow shading represents the period of road mortality surveys.

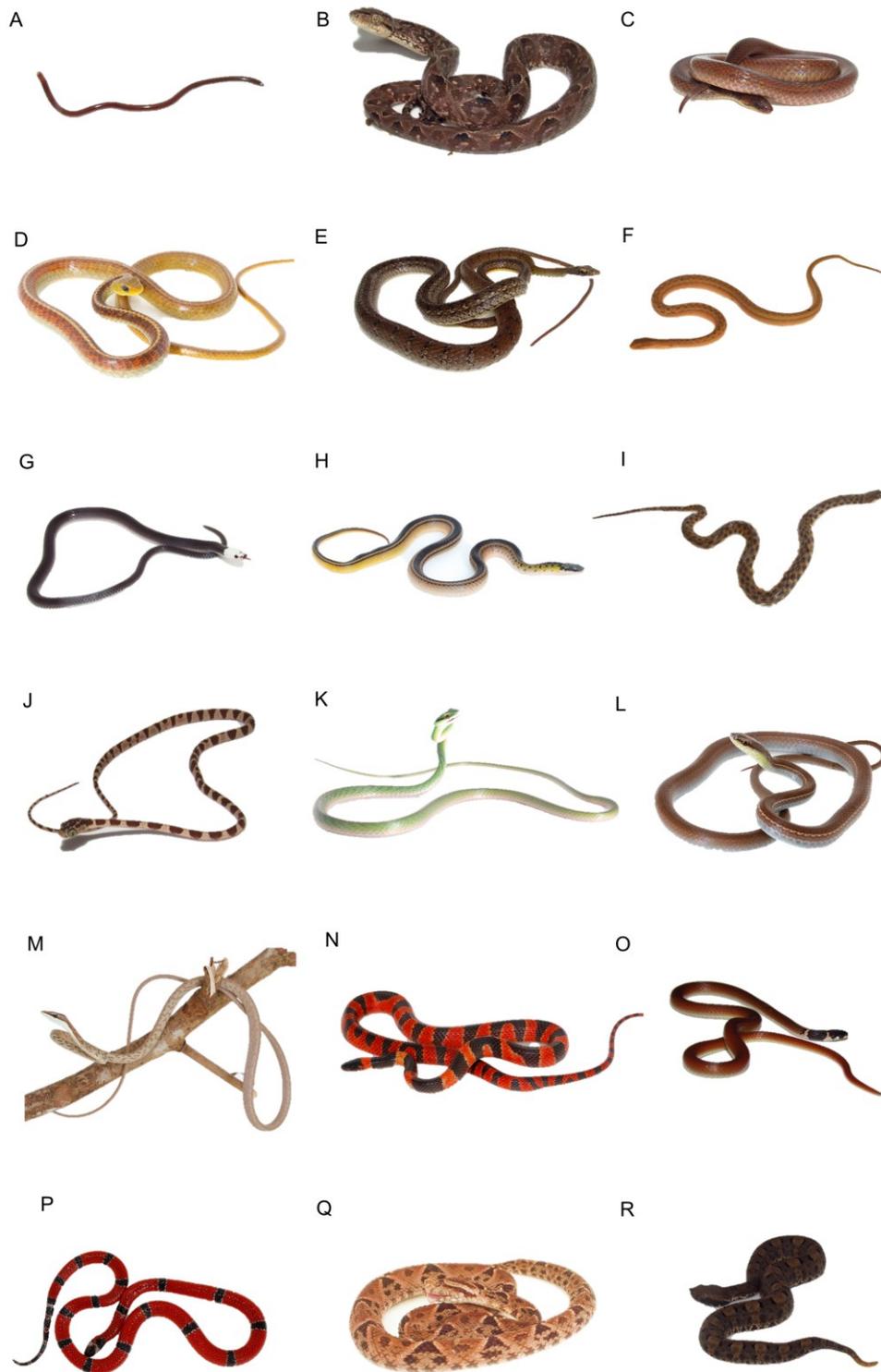
**Figure 3.** Photographs of the study area in the municipality of Puerto Wilches, Santander, Colombia, highlighting the main natural and anthropogenic habitats.



Notes. A) View of the Magdalena River looking west; the southern foothills of the Serranía de San Lucas are visible in the distance; B) dense forest border; C) riparian forest border; D) open forest; E) flooded shrubland; F) pasture; G) paved road.

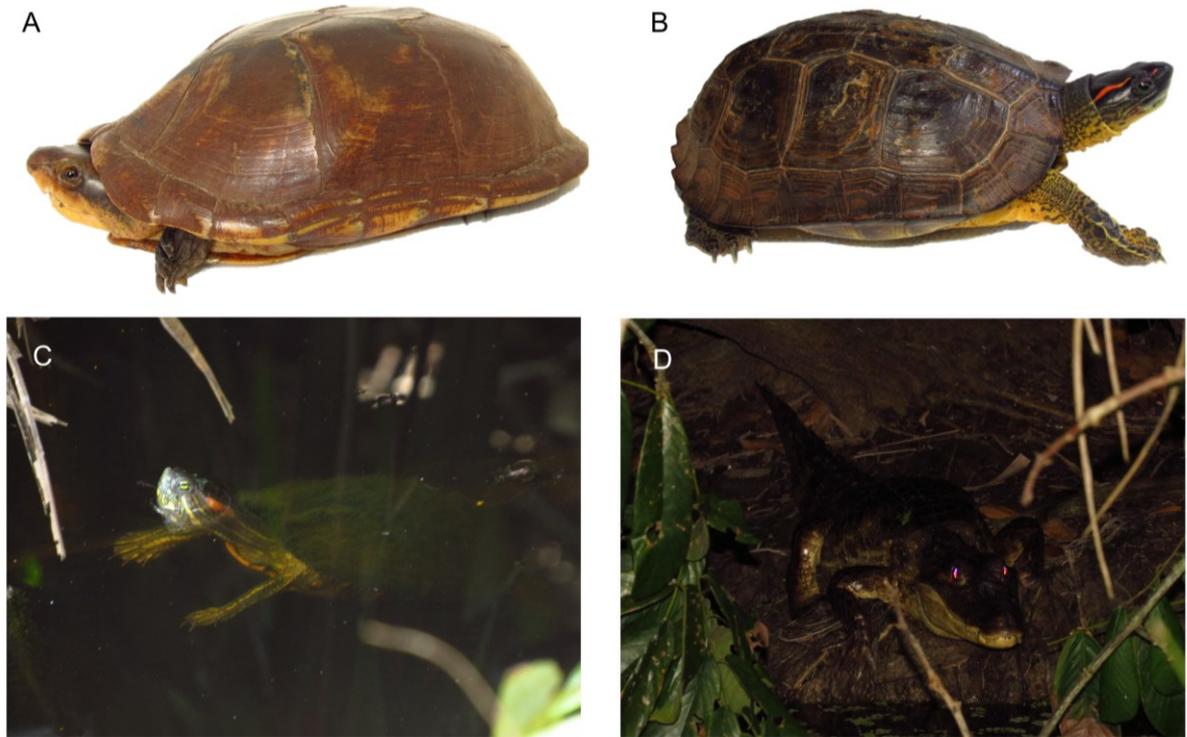
Figure 4. Lizard species recorded during the survey in Puerto Wilches, Santander, Colombia.



**Figure 5.** Snake species recorded during the survey in Puerto Wilches, Santander, Colombia.

Notes. A) *Liotyphlops bondensis*; B) *Corallus ruschenbergerii*; C) *Atractus* sp.; D) *Chironius spixi*; E) *Dendrophidion percarinatum*; F) *Dryophylax gambotensis*; G) *Enuliophis sclateri*; H) *Erythrolamprus melanotus*; I) *Helicops danieli*; J) *Imantodes cenchoa*; K) *Leptophis occidentalis*; L) *Mastigodryas boddaerti*; M) *Oxybelis aeneus* complex; N) *Oxyrhopus petolarius*; O) *Tantilla melanocephala*; P) *Micrurus dumerilii*; Q) *Bothrops asper*; R) *Porthidium lansbergii*.

**Figure 6.** Turtles and the crocodylian recorded during the survey in Puerto Wilches, Santander, Colombia.



Notes. A) *Kinosternon scorpioides*; B) *Rhinoclemmys melanosterna*; C) *Trachemys callirostris*; D) *Caiman crocodylus*.

**Figure 7.** Human-induced mortality of reptiles in Puerto Wilches, Santander, Colombia.



Notes. A) Foraging behavior observations of *Caiman crocodylus*; B-C) Snake Road mortality resulting from vehicle strikes recorded during this study.

## Discussion

Non-avian reptile species from Puerto Wilches represent approximately half of those documented in the mMRB below 500 m a.s.l. (Table 3S). Furthermore, species richness in Puerto Wilches accounts for more than 75% of the species shared with wetland areas in the mMRB, such as Yondó and Ciénaga de Zapatosa (Medina-Rangel, 2011; Vargas-Salinas & Aponte-Gutiérrez, 2016). The recorded species composition is characteristic of the tropical rainforest of the Magdalena River basin and is closely associated with elements of the Pacific rainforest (see Moreno-Arias et al., 2008; Carvajal-Cogollo, 2019 for extended discussions). To a lesser extent, it is also linked to species found in the Caribbean and Orinoco regions (e.g., Caribbean: *A. auratus*, *A. bifrontata*, *C. spixi*, *D. gambotensis*, *H. danieli*, *S. lineolatus*, *C. lemniscatus*; Orinoquia: *A. auratus*, *C. ruschenbergerii*, *M. dumerilii*, *T. melanocephala*).

Contrary to previous studies analyzing diversity and biogeographic patterns in the mMRB (Moreno-Arias et al., 2008), Puerto Wilches exhibited a greater diversity of snakes than lizards, with snakes accounting for 52% of total richness and lizards 38%. In Yondó (Antioquia), Vargas-Salinas & Aponte-Gutiérrez (2016) recorded fewer than half of the snake species documented in Puerto Wilches (12 vs. 26). However, several reptile species—such as *Basiliscus basiliscus*, *Chelonoidis carbonarius*, *Podocnemis lewyana*, and *Siphlophis cervinus*—were recorded by Vargas-Salinas & Aponte-Gutiérrez (2016), but were not detected in Puerto Wilches.

It would be valuable to assess how the meandering dynamics of the Magdalena River (Figure 1) may act as a physical barrier to individual dispersal—and consequently gene flow—between non-avian reptile populations on opposite riverbanks, excluding aquatic species such as some turtles and crocodilians. Hurtado-Gómez et al. (2024) recently showed that isolation by distance and river course alterations have likely influenced the genetic structuring of the aquatic snake *H. danieli*. We concur with this interpretation, as the Magdalena River can reach widths of 1 km in this region. This breadth separates the primary

forests of the Serranía de San Lucas, a core area for biodiversity conservation, from the opposite riverbank where Puerto Wilches is located (Figure 1). Future studies explicitly testing this hypothesis, particularly those incorporating genetic approaches, may provide further evidence to support conserving strategies for non-avian reptiles in the transformed landscapes of the mMRB.

The snake species *D. gambotensis*, *H. danieli*, *L. bondensis*, and *M. camilae* are endemic to the dry and humid forests of northern South America and warrant further studies to evaluate their population status in Puerto Wilches. The records presented here represent the southernmost known occurrences of *D. gambotensis*, whose nearest previously documented locality is the Ciénaga de Zapatosa (Cesar Department) (Medina-Rangel, 2011, 2013). In contrast, *A. festae* is a lizard inhabiting humid and very humid tropical forests of the Pacific region of Colombia, Ecuador, and Panama (Guerra-Correa, 2017); to our knowledge, this constitutes the first record for humid forests of the mMRB. We further infer that the record of *Ptychoglossus* sp. reported by Vargas-Salinas & Aponte-Gutiérrez (2016) for Yondó likely corresponds to *A. festae*.

*Liotyphlops bondensis* is a fossorial snake distributed across humid and dry forests of Colombia's inter-Andean valleys and Caribbean region (Linares-Vargas et al., 2021). This species remains poorly known due to its infrequent detection in herpetological surveys. The incorporation of complementary sampling methods, such as pitfall traps, is therefore necessary to increase detection probability for this and other fossorial species and to obtain additional information on their natural history in the mMRB.

Riparian forests exhibited high species richness, supporting approximately 70% of all species recorded in the entire study area. To enhance habitat quality and ecosystem function, forest corridors should be expanded to restore structural connectivity and facilitate species movement at the landscape scale. In contrast, dense forests harbored a higher proportion of rare species. Consistent with previous studies (e.g., Carvajal-Cogollo & Urbina-Cardona, 2008; Urbina-Cardona et al., 2008), dense forests in Puerto Wilches

supported the greatest diversity of rare non-avian reptile species. Species such as *A. festae*, *Atractus* sp., *E. sclateri*, and *M. dumerilii* were recorded exclusively in this hábitat type. These species may be particularly vulnerable to fragmentation and habitat loss due to narrow ecological and physiological tolerance thresholds (Urbina-Cardona et al., 2008) and may therefore depend on unfragmented, mature forests. To promote reptile conservation and local biodiversity, we recommend protecting mature forest fragments in southeastern Puerto Wilches to prevent further deforestation (Figure 1). Additionally, increasing forest cover along streams and creeks that flow directly or indirectly into the swamp complex and the Magdalena River is strongly recommended.

## Conclusions

Based on intensive fieldwork conducted during 2021-2022, we present a comprehensive checklist of non-avian reptiles from Puerto Wilches. The presence of endemic species and poorly known species highlights the importance of targeted conservation actions aimed at safeguarding these populations. Further studies, including population genetics and long-term ecological monitoring, are essential to better understand the effects of habitat transformation on reptile assemblages in the mMRB.

## Acknowledgments

This study was conducted under the Agreements 21-095-2021 and 21-450-2022 between the Instituto de Investigación de Recursos Biológicos Alexander von Humboldt and the Agencia Nacional de Hidrocarburos (ANH). We thank Adriana Restrepo, Diana Díaz, and Juanita Valdivieso for scientific and logistical coordination. We also thank Oriana Ceballos and Sergio Vargas Troncoso for providing data on road-killed specimens. Carolina Gómez, Sandra Galeano, and Andrés R. Acosta provided workspace and mentoring at the Biological Collections of the Instituto Humboldt. We are grateful to Viviana Cartagena and Diego Alzate for field assistance during the first expedition, and to Alejandra Arias and Leonardo Niño for field assistance during the second

expedition and laboratory assistance at the Instituto Humboldt.

We thank the people of Puerto Wilches for granting the permissions to conduct fieldwork on their properties, particularly to Agropalma S. A., Palmas Oleaginosas Bucarelia S. A. S., and Palmas Monterrey S. A. We are deeply indebted to our field guides Wilfrido Pacheco, Alejandra Martínez, and Feisal Hernández, as well as to all vehicle drivers, for their invaluable assistance and companionship throughout this research.

We dedicate this work to the memory of Federico Medem (1912-1984), who greatly promoted the study and conservation of reptiles in Colombia. The first author received a doctoral fellowship (BPIN 2022000100055 – Becas V) from the Colombian Ministerio de Ciencia, Tecnología e Innovación.

## Author contributions

Study design: Alejandra María Salazar Guzmán, Julián A. Rojas Morales, Francisco Nieto. Data collection: Alejandra María Salazar Guzmán, Julián A. Rojas Morales, Francisco Nieto. Data analysis: Alejandra María Salazar Guzmán, Julián A. Rojas Morales. Manuscript drafting: Julián A. Rojas Morales. All authors read and approved the final manuscript.

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