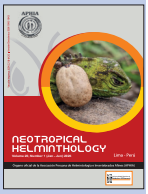
ISSN Versión Impresa 2218-6425 ISSN Versión Electrónica 1995-1403

Neotropical Helminthology, 2026, vol. 20 (2), 281-286

Neotropical Helminthology



ORIGINAL ARTICLE / ARTÍCULO ORIGINAL

CIRCULATION OF OROPOUCHE VIRUS (OROV) IN FIVE MUNICIPALITIES OF CAMAGÜEY, CUBA: A CASE SERIES, JUNE–OCTOBER 2024

CIRCULACIÓN DEL VIRUS OROPOUCHE (VORO) EN CINCO MUNICIPIOS DE CAMAGÜEY, CUBA: SERIE DE CASOS, JUNIO-OCTUBRE DE 2024

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ABSTRACT

Oropouche virus (OROV) is an emerging arbovirus that has shown rapid geographic expansion across the Americas. In Cuba, the first cases were confirmed in 2024. This study describes OROV positivity in municipalities of Camagüey Province between June and October 2024 and characterizes its distribution by sex and geographic area. An observational, descriptive, cross-sectional study was conducted. A total of 103 suspected cases reported in thirteen municipalities were included. Confirmation was performed by real-time RT-PCR at the reference laboratory of the "Pedro Kourí" Institute of Tropical Medicine (IPK) in Havana. Twenty-seven cases were confirmed (26.2 % positivity): thirteen women (48.1

Este artículo es publicado por la revista Neotropical Helminthology de la Facultad de Ciencias Naturales y Matemática, Universidad Nacional Federico Villarreal, Lima, Perú auspiciado por la Asociación Peruana de Helmintología e Invertebrados Afines (APHIA). Este es un artículo de acceso abierto, distribuido bajo los términos de la licencia Creative Commons Atribución 4.0 Internacional (CC BY 4.0) [https:// creativecommons.org/licenses/by/4.0/deed.es] que permite el uso, distribución y reproducción en cualquier medio, siempre que la obra original sea debidamente citada de su fuente original.



DOI: https://doi.org/10.62429/rnh20262022227

%) and fourteen men (51.9 %). Viral circulation was detected in five municipalities (38.5 %): Camagüey, Florida, Minas, Céspedes, and Vertientes. Positivity reached 100 % in some subgroups (Florida, men, June; Céspedes, both sexes, July). Circulation of OROV was corroborated in Camagüey Province, with a balanced distribution by sex. Strengthening entomological and clinical surveillance is recommended, especially during periods of high arbovirus transmission.

Keywords: arbovirus – Camagüey – Cuba – epidemiological surveillance – Oropouche virus

RESUMEN

El virus Oropouche (OROV) es un arbovirus emergente que ha mostrado una rápida expansión geográfica en las Américas. En Cuba, los primeros casos se confirmaron en 2024. Este estudio describe la positividad de OROV en municipios de la provincia de Camagüey entre junio y octubre de 2024 y caracteriza su distribución por sexo y área geográfica. Se realizó un estudio observacional, descriptivo y transversal. Se incluyó un total de 103 casos sospechosos notificados en trece municipios. La confirmación se realizó mediante RT-PCR en tiempo real en el laboratorio de referencia del Instituto de Medicina Tropical "Pedro Kourí" (IPK), de La Habana. Se confirmaron veintisiete casos (26,2 % de positividad): trece mujeres (48,1 %) y catorce hombres (51,9 %). Se detectó circulación viral en cinco municipios (38.5 %): Camagüey, Florida, Minas, Céspedes y Vertientes. La positividad alcanzó el 100 % en algunos subgrupos (Florida, hombres, junio; Céspedes, ambos sexos, julio). Se corroboró la circulación de OROV en la provincia de Camagüey, con una distribución equilibrada por sexo. Se recomienda fortalecer la vigilancia entomológica y clínica, especialmente durante los períodos de alta transmisión de arbovirus.

Palabras clave: arbovirus – Camagüey – Cuba – vigilancia epidemiológica – virus Oropouche

INTRODUCTION

Oropouche fever is an emerging arboviral disease caused by Oropouche virus (OROV), a member of the family Peribunyaviridae. The biting midge *Culicoides paraensis* is the primary vector, although *Culex quinquefasciatus* mosquitoes can also transmit it (PAHO, 2025a; García *et al.*, 2026). Recently, Martínez *et al.* (2025) reported the first detection of *C. paraensis* in Cuba during the initial Oropouche fever outbreak outside the Amazon region.

Traditionally endemic to the Amazon basin, since late 2023 OROV has experienced an unprecedented geographic expansion into new areas of the Americas (Scotto *et al.*, 2025; Sharma *et al.*, 2026). Climate change, deforestation, and unplanned urbanization favor this spread to previously unaffected regions, such as urban areas of Cuba (PAHO, 2025a; Martínez *et al.*, 2025). A recent systematic review confirmed the high vector competence of *C. paraensis* for OROV, explaining its rapid dissemination in territories where this vector becomes established (Gallichotte *et al.*, 2025).

The first Cuban outbreak was documented in 2024, with all provinces reporting cases (Gómez *et al.*, 2025). Between May and June 2024, the first 25 cases were confirmed in Mayabeque, Matanzas, and Villa Clara provinces, with a male-to-female ratio of 1.1 and a median age of 34.5 years (CDC, 2024). By late May 2024, the Ministry of Public Health (MINSAP) reported outbreaks in Santiago de Cuba and Cienfuegos, totaling 74 confirmed cases (WHO, 2024). By January 2025, Cuba had accumulated 626 confirmed cases and 23,638 suspected cases, affecting 73.8% of its municipalities. Phylogenetic studies indicated that the virus was introduced into Cuba in the first quarter of 2024, likely from the Brazilian state of Acre (PAHO, 2025a; Jiménez *et al.,* 2024).

This study describes suspected and confirmed OROV fever cases in Camagüey province between June and October 2024, aiming to characterize positivity by sex and municipality.

MATERIALS AND METHODS

Study design and area

An observational, descriptive, cross-sectional study was conducted. All suspected cases notified by epidemiological surveillance in the thirteen municipalities of Camagüey province were included: Camagüey (capital), Florida, Jimaguayú, Minas, Najasa, Sibanicú, Céspedes, Esmeralda, Vertientes, Guáimaro, Nuevitas, Santa Cruz del Sur, and Sierra de Cubitas. The study period comprised June 1 to October 31, 2024.

Definitions

— Suspected case: Patient with acute febrile syndrome (axillary temperature ≥38°C, <7 days of evolution) plus at least two of the following: retro-orbital headache, myalgia, arthralgia, photophobia, vomiting, rash, or lower back pain; with negative IgM for dengue and no diagnosis of other arboviruses; and with epidemiological history of residence or visit within the previous 14 days to an area with confirmed or suspected OROV circulation.

— Confirmed case: A suspected case with a positive result for OROV by real-time RT-PCR (reverse transcription–polymerase chain reaction) in a serum or plasma sample processed at the reference laboratory of the "Pedro Kourí" Institute of Tropical Medicine (IPK) in Havana.

— Excluded case: Patient with confirmed diagnosis of dengue (IgM+), Chikungunya, Zika, or another arbovirus during the same episode.

Statistical analysis

Absolute frequencies and percentages of positivity by sex and municipality were calculated. IBM SPSS Statistics version 25.0 software was used.

Ethical considerations

The study adhered to the principles of the Declaration of Helsinki (WMA, 2024), which states that every precaution must be taken to protect the privacy of research participants and the confidentiality of their personal information. The latter was ensured through anonymization of the database prior to analysis, removal of direct identifiers, and secure storage of information in a system with restricted access. As the research was based on routine epidemiological surveillance data, additional informed consent was not required, in accordance with current Cuban regulations (Ley 149, 2022) and the WHO guidelines (WHO, 2017) on ethical issues in public health surveillance, which state that under certain circumstances, requiring informed consent may be ethically inappropriate when reliable, valid, and complete datasets are needed, and appropriate safeguards are in place.

RESULTS

During the study period, 103 suspected cases were notified: 51 females (49.5 %) and 52 males (50.5 %). A total of 27 cases were confirmed (26.2 % overall positivity): 13 females (25.5 % positivity among females) and 14 males (26.9 % positivity among males).

Viral circulation was confirmed in five municipalities (38.5 % of the thirteen studied): Camagüey, Florida, Minas, Céspedes, and Vertientes. Table 1 shows the details by municipality, month, and sex. The highest positivity (100 %) was observed in the following subgroups: Florida (males, June), Minas (females, June), Céspedes (both sexes, July), Vertientes (females, July), and Camagüey (males, June and October).

Table 1. Suspected cases, confirmed cases, and Oropouche virus positivity by municipality, month, and sex. Camagüey, June–October 2024.

		Suspected cases		Confirmed cases		Positivity rate (%)	
Month	Municipality	Female	Male	Female	Male	Female	Male
June	Camagüey	6	1	0	1	0.00	100.00
	Florida	3	3	2	3	66.67	100.00
	Jimaguayú	0	1	0	0	0.00	0.00
	Minas	3	4	3	2	100.00	50.00
	Najasa	2	1	0	0	0.00	0.00
	Sibanicú	1	2	0	0	0.00	0.00

(Continúa Table 1)

(Continúa Table 1)

	Camagüey	24	15	4	1	16.67	6.67
	Céspedes	2	1	2	1	100.00	100.00
	Esmeralda	2	0	0	0	0.00	0.00
	Florida	7	3	0	0	0.00	0.00
July	Minas	11	8	0	0	0.00	0.00
	Najasa	0	1	0	0	0.00	0.00
	Santa Cruz del Sur	2	3	0	1	0.00	33.33
	Vertientes	2	3	2	1	100.00	33.33
August	Najasa	0	1	0	1	0.00	100.00
	Céspedes	0	1	0	0	0.00	0.00
	Esmeralda	1	2	0	0	0.00	0.00
	Florida	2	7	0	0	0.00	0.00
	Guáimaro	3	2	0	0	0.00	0.00
	Nuevitas	4	2	0	0	0.00	0.00
	Santa Cruz del Sur	1	1	0	0	0.00	0.00
	Sibanicú	1	0	0	0	0.00	0.00
October	Sierra de Cubitas	1	0	0	0	0.00	0.00
	Vertientes	3	2	0	0	0.00	0.00
	Camagüey	0	1	0	1	0.00	100.00

Confirmed cases were detected during months of low apparent transmission (August and October), suggesting sustained low-level viral circulation or possible re-introductions.

DISCUSSION

Our findings confirm Oropouche virus circulation in five municipalities of Camagüey, with an overall positivity of 26.2 % and a balanced sex distribution (male-to-female ratio 1.1). These results are consistent with reports from the initial Cuban cases (Benítez *et al.*, 2024) and with regional data from PAHO (2025b) showing similar affectation between sexes (Gómez *et al.*, 2025).

The presence of cases in August and October, outside the expected epidemic peak, supports the hypothesis of low-level endemic circulation or periodic reintroductions, as described in the Amazon region (Scotto *et al.*, 2025). The Cuban surveillance system, based on active screening of febrile syndromes, has enabled detection of these events.

High positivity (100 %) was observed in municipalities such as Céspedes and Vertientes during July, which may reflect localized outbreaks and the need to intensify vector control efforts in these foci. The simultaneous presence of dengue and Oropouche in the territory (Gómez *et al.*, 2025) poses a diagnostic and clinical management challenge. Rosales *et al.* (2025) have highlighted the urgency of developing vaccines against circulating arboviruses in Cuba, which is particularly relevant for Camagüey (Gómez *et al.*, 2025; García *et al.*, 2026).

A relevant aspect to consider is the ability of OROV to persist in different tissues and body fluids. Recent studies have demonstrated the presence of active viral RNA in whole blood, urine, and semen up to four months post-infection, suggesting that these fluids could play a role in non-vector transmission and in maintaining viral circulation during periods of low vector activity (Matucci *et al.,* 2025). This phenomenon could partially explain the detection of confirmed cases during months such as August and October in our series.

This study has several limitations: a) the small number of confirmed cases, limiting generalizability; b) absence of detailed clinical data (symptoms, complications, outcomes); c) inability to calculate incidence rates due to lack of monthly population denominators by municipality; d) potential reinfections were not assessed due to lack of serological follow-up. Nevertheless, despite these limitations, this is the first specific report of Oropouche fever cases in Camagüey province with municipal and

monthly disaggregation, allowing adjustment of entomo-epidemiological surveillance actions in the territory (PAHO, 2025b).

In conclusion, Oropouche virus circulation is confirmed in at least five municipalities of Camagüey province (Camagüey, Florida, Minas, Céspedes, and Vertientes), with an overall positivity of 26.2% and a balanced sex distribution. Detection of cases during low-transmission months suggests sustained circulation.

Therefore, we recommend strengthening entomological surveillance through weekly *C. paraensis* collections in municipalities with confirmed positivity, training primary healthcare personnel in the differential diagnosis of arboviruses, establishing an early warning system based on increases in nonspecific febrile syndromes, and prioritizing RT-PCR sample collection in the municipalities of Florida, Minas, and Céspedes.

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Validation: NNV, YJP, YCG, DMZ, LDF, JRAF
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Received July 30, 2026.

Accepted September 18, 2026.

Published online September 21, 2026.