

First Record of Natural Transovarial Transmission of Dengue Virus in *Aedes albopictus* from Cuba

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INTRODUCTION

The world has experienced an increase in dengue incidence in the recent years. Recent investigations estimate that approximately 2.5 billion people live in countries where dengue fever is endemic and the WHO estimates 100–400 million infections every year. Dengue illness is distributed worldwide and is mainly transmitted by two widespread mosquito vectors *Aedes (Stegomyia) aegypti* (L) and *Aedes (Stegomyia) albopictus* (Skuse).

Aedes aegypti is the main vector of dengue in the world. *Aedes albopictus* is considered the potential vector of this arbovirus in some regions where *Ae. aegypti* is absent such as Southeastern Asia, Europe, and the Mediterranean. However, *Ae. albopictus* has never been incriminated in the horizontal transmission of DENV in the American region.

Aedes albopictus was introduced in Cuba in 1995, and currently it is distributed in 14 of the 15 provinces of the country. However, the role of *Ae. albopictus* in the transmission of DENV in Cuba is unknown.

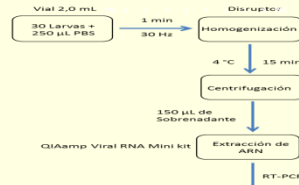
OBJECTIVE

Determine the presence of DENV in a Cuban *Aedes albopictus* population.

MATERIALES Y METHODS

- The study was carried out in Cotorro municipality (23°01'34"N, 82°14'51"W), Havana, Cuba..
- The municipality has a total area of 65.9 km² and a population density of 1,219.8 inhabitants/km².
- Aedes albopictus* larvae were collected by Campaign workers during the month of November 2019 .
- A total of 450 mosquito larvae were morphologically identified at the Vector Control Department, IPK.
- Mosquito larvae were collected from fifteen tree holes scattered over an area of 100 m² and grouped into groups of thirty larvae for DENV detection.

Diagnóstico molecular de DENV en mosquitos a través de la RT-PCR



Cebador	Secuencia 5'-3'	Posición en el genoma	Tamaño del producto (pb)	Serotipo
D1	TAATATGCTGAAACCGCGGAGAAACCG	134-161	511	
D2	TTGCACCAACAGCTAATGCTTCAGGTTCC	616-644		
TS1	CGTCTCAGTGATCCGGGGG	568-586	482 (D1-TS1)	DENV-1
TS2	CGCCACAAGGGCCATGAACAG	232-252	119 (D1-TS2)	DENV-2
TS3	TAACATCATCATGAGACAGAGC	400-421	290 (D1-TS3)	DENV-3
TS4	CTCTGTGTCTAAACAAGAGA	506-527	392 (D1-TS4)	DENV-4

Electroforesis en gel de agarosa al 2%

Lanciotti, 1992

RESULTS

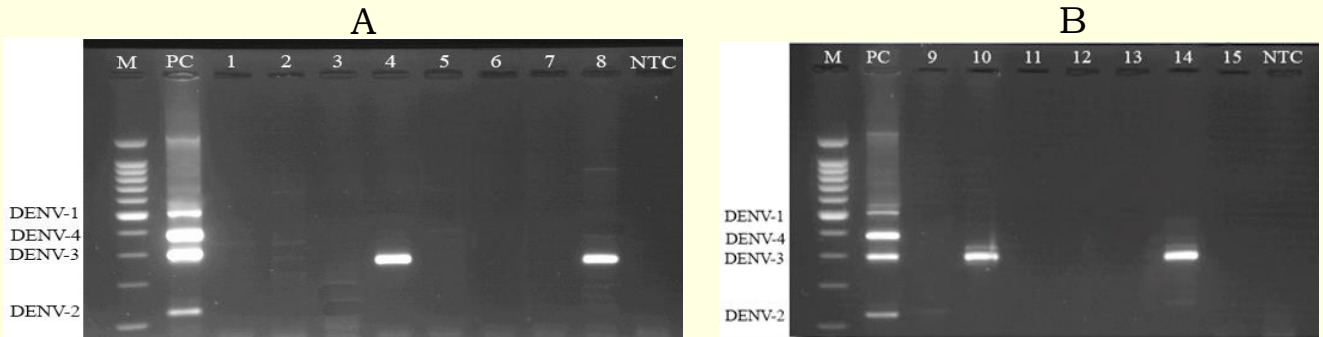


Figure. 1 (A, B). Nested RT-PCR assay of DENV in pools of *Ae. albopictus* larvae. Positive control (PC) of DENV serotypes. (A) Lanes 4 and 8 showed the products of DENV-3 (290 bp) obtained by nested PCR following RT-PCR. (B) Lanes 10 and 14 showed the products of DENV-3 (290 bp) obtained by nested PCR following RT-PCR. Non-template control (NTC) and lane M, marker of 100 bp. DNA sizes are given in base pairs.

DENV-3 serotype was detected in four out of 15 pools of *Ae. albopictus* larvae from Cotorro municipality (Figure 1A and B) and the MIR was 8.88. No other DENV serotypes were detected in any of the pools.

DISCUSSION

- For the first time, vertical transmission of DENV was detected in Cuban *Ae. albopictus* populations. The finding of DENV-3 in *Ae. albopictus* larvae could have an important implication for the dengue epidemiological surveillance system.
- Our results suggest that studies of vector competition and vertical transmission of Cuban *Ae. albopictus* populations can help elucidate the potential role of this species as a vector of DENV in Cuba.
- This finding may lead to modifications of vector control strategies in Cuba to combat *Ae. albopictus* due to its different ecological habits compared to *Ae. aegypti*.

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