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Evidence of Vertical Transmission of Dengue Virus in Two Endemic Localities in the State of Oaxaca, Mexico

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Key Words
Transovarial transmission · Dengue · *Aedes aegypti* · Reverse transcription-polymerase chain reaction · Dengue virus

Abstract
Background: Dengue virus is spread in tropical areas of the world and is the causative agent of dengue fever and dengue hemorrhagic fever. It is horizontally transmitted to humans by infected *Aedes* mosquitoes, but it is also able to be vertically or transovarially transmitted to insect progeny. ***Objective:*** In this work, we analyzed the vertical transmission of dengue virus in *Aedes aegypti* mosquitoes collected in two endemic localities in the state of Oaxaca, Mexico. ***Methods:*** The collected larvae were grown in the laboratory and transovarial transmission of dengue virus, either in larvae or newly emerged mosquitoes, was investigated using a semi-nested reverse transcription-polymerase chain reaction method. ***Results:*** Although the presence of dengue virus in larvae could not be demonstrated, the viral genome was amplified in 4 out of 43 pools of in-cage born mosquitoes: DEN 2, 3 and 4 serotypes were detected in 2 pools from Tuxtepec and two from Juchitán. ***Conclusion:*** The results presented here strongly suggest that dengue virus can be vertically transmitted in mosquitoes from Oaxaca, but more studies will be necessary to analyze the epidemiological impact of this mechanism of transmission.

Dengue is the most important mosquito-borne viral disease in the world [1] with 100 million cases of dengue infection, 500,000 cases of dengue hemorrhagic fever (DHF) and 21,000 dengue-related deaths reported per year [1, 2]. This virus is spread throughout the world in tropical areas located between latitudes 30° N and 40° S [2]. The disease displays several manifestations ranging from asymptomatic infection to an influenza-like disease called dengue fever (DF), to a DHF. Some cases of DHF can evolve to dengue shock syndrome which may be fatal [3]. The severity of the disease and the magnitude of the outbreak depend on several factors such as the vector, virus, environment, immunological status of the infected people, and socioeconomic level of the population [4].

Dengue is caused by four serotypes of the single-stranded RNA dengue virus (DEN 1–4), which are members of the *Flaviviridae* family. They are transmitted to

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