


RESEARCH ARTICLE

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Host-seeking *Aedes aegypti* linked to dengue seropositive households at northeastern MexicoMario A Rodriguez-Perez¹, Monsuru A Adeleke², Tanya L Russell³, Omar Olguin-Rodriguez¹, Stephanie V Laredo-Tiscareño¹, Javier A Garza-Hernandez⁴, Filiberto Reyes-Villanueva¹¹ Laboratorio de Biomedicina Molecular, Centro de Biotecnología Genómica, Instituto Politécnico Nacional, Reynosa, Tamaulipas, México² Public Health Entomology and Parasitology Unit, Department of Biological Sciences, Osun State University, Osogbo, Nigeria³ Australian Institute of Tropical Health and Medicine, James Cook University, Cairns, Queensland, Australia⁴ Laboratorio de Entomología Médica, Instituto de Ciencias Biológicas, Universidad Autónoma de Ciudad Juárez, Cd. Juárez, Chihuahua, Mexico

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Background & objectives: Dengue is endemic in the cities along the USA-Mexico border where accurate interventions against *Aedes aegypti* are required to curb transmission. Here, we examined the link of 11 entomological variables with households (HHs) seropositive (Y=1) or seronegative (Y=0) depending on the proportion of seropositive participants/total participants per HH, and identified the DENV serotypes in mosquito vectors. **Methods:** Three entomologic (spring, summer and fall) and two serologic surveys (spring and fall) were conducted in 77 HHs in Reynosa, Mexico in 2014. Water-filled containers, larvae and pupae were recorded per HH, with adult *Ae. aegypti* captured with a backpack aspirator and in human landing collections (HLC). In spring and fall we determined the incidence of IgG and IgM dengue antibodies per HH, and the DENV serotypes in mosquitoes collected indoors. **Results:** The surveyed HHs were infested with 1573 female and 1142 male *Ae. aegypti*. About 56% and 46% of 322 residents were participants in spring and fall, respectively resulting 117 and 95 positive cases for IgG/IgM, in 68% and 62% of seropositive HHs. Recent transmission occurred at 8% HHs with three IgM-positive participants and three IgG seroconversions, and all seropositive samples were for DENV-2. A multivariate analysis showed that the host-seeking females (HSFs) (339) were the only explanatory variable linked to 48 seropositive HHs in the fall, with the 85% (289) clumped in 24 HHs. Further, the HSFs were correlated linearly with the number of IgG/IgM cases/HH where an increase in 50 mosquitoes matched to one IgG/IgM case. Finally, DENV-2 was found highly amplified (10^7 RNA copies/ml) in one pool of 10 male *Ae. aegypti*, and at $3.40 \text{ Log } 10^4$ in one male *Ae. albopictus*. **Interpretation & conclusion:** Dengue transmission is stable in the examined HHs. Abundance of HSF *Ae. aegypti* was associated to seropositive HHs, and summing our results to the literature, the four DENV serotypes circulate in humans and vectors at the bordering corridor of Reynosa - Matamoros, Mexico, where indoor interventions against HSFs in August-September are needed to halt viral amplification and transmission.

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