

Comunicações Breves

Brief Communications

Aedes albopictus may not be vector of dengue virus in human epidemics in Brazil

Aedes albopictus pode não ser vetor da dengue durante epidemias no Brasil

Nicolas Degallier^a, José Marcus Sócrates Teixeira^a, Sidinei da Silva Soares^b, Regilene D Pereira^a, Santuzza C F Pinto^a, Antonio de Jesus Melo Chaib^a, Pedro F C Vasconcelos^c and Enilce Oliveira^d

^aLaboratório Central da Secretaria Estadual da Saúde. Brasília, DF, Brazil. ^bFundação Nacional de Saúde do Ministério da Saúde. Mangueiras, RJ, Brazil. ^cInstituto Evandro Chagas. Ministério da Saúde. Belém, PA, Brazil. ^dDiretoria de Vigilância Ambiental da Secretaria Estadual da Saúde. Brasília, DF, Brazil

Keywords

Dengue, transmission. Dengue virus, isolation & purification. Disease outbreaks. *Aedes*. *Aedes aegypti*. *Aedes albopictus*. Human serology.

Descritores

Dengue, transmissão. Vírus da dengue, isolamento & purificação. Surto de doenças. *Aedes*. *Aedes aegypti*. *Aedes albopictus*. Sorologia humana.

Abstract

Over 60,500 dengue cases were reported in the state of Espírito Santo (ES), Brazil, between 1995 and 1998. The study's purpose was to identify whether *Aedes albopictus* was transmitting the dengue virus during an epidemic in the locality of Vila Bethânia (Viana County), Vitória, ES. From April 3 to 9, 1998, blood and serum samples were collected daily for virus isolation and serological testing. Four autochthonous cases were confirmed through DEN 1 virus isolation and two autochthonous cases through MAC ELISA testing. Of 37 *Ae. aegypti* and 200 *Ae. albopictus* adult mosquitoes collected and inoculated, DEN1 virus was isolated only from a pool of two *Ae. aegypti* female mosquitoes. The study results suggest that *Ae. albopictus* still cannot be considered an inter-human vector in dengue epidemics in Brazil.

Resumo

Mais de 60.500 casos de dengue foram notificados no Espírito Santo, entre 1995 e 1998. Realizou-se estudo com o objetivo de averiguar se o mosquito *Aedes albopictus* estava transmitindo o vírus durante uma epidemia em Vila Bethânia (Viana), no sudeste de Vitória, capital capixaba. De 3 a 9 de abril de 1998, amostras de sangue e (ou) soro de pacientes foram coletadas e os mosquitos foram capturados diariamente, tanto para isolamento viral como para testes sorológicos. Em onze casos autóctonos, quatro foram confirmados por isolamento do vírus DEN 1, e dois por reação MAC ELISA. Das 37 *Ae. aegypti* e 200 *Ae. albopictus* adultos capturados e inoculados, apenas uma amostra de vírus DEN 1 foi obtida de um lote de duas fêmeas de *Ae. aegypti*. Os resultados sugerem que a espécie *Ae. albopictus* ainda não pode ser considerada um vetor inter-humano durante epidemias de dengue no Brasil.

INTRODUCTION

Since the introduction of *Aedes albopictus* in Brazil,¹ the vector potentiality of this species has remained a controversial issue.² Recent evidence showed that dengue virus may be vertically transmitted by this species in nature* but no data were

available on its man-to-man vector potentiality. The study presents the findings of an entomo-epidemiological survey conducted from April 3 to 9, 1998 at the ending phase of an outbreak of more than 60,500 cases in the locality of Vila Bethânia, Viana county, southeast of the capital Vitória, state of Espírito Santo.

Correspondence to:

Nicolas Degallier
Instituto de Pesquisa para o Desenvolvimento
Unidade de Pesquisa 034
Caixa postal 7091 Lago Sul
71619-970 Brasília, DF, Brasil
E-mail: degallie@solar.com.br

*Personal communication of Marcelo C. Resende, of the Fundação Nacional de Saúde, Belo Horizonte, Minas Gerais, Brazil.

Financial support have been provided by Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq - Processo n. 910042/97-7).

Presented to the 10th National Meeting of Virology and 2nd Mercosul Meeting of Virology, Curitiba, PR, Brazil, 1999.

Received on 20/6/2002. Reviewed on 16/10/2002. Approved on 12/11/2002.

METHODS

Blood and/or serum samples of sick people were drawn and mosquitoes, either resting or landing on people, were collected daily inside and outside patients' houses. Human sera were tested using MAC ELISA (Enzyme-Linked ImmunoSorbent Assay) and blood samples were inoculated into C6/36 *Ae. albopictus* cell cultures for isolation attempts. The mosquitoes were anaesthetized at 4°C, pooled (up to 20 spec. by pool) by date, site, species and sex, and stored at -70°C until inoculation. The abdomens of female mosquitoes were cut off in order to eliminate any possible contamination of the pools with previously ingested blood. The pools were inoculated into C6/36 cell cultures and intracerebrally into suckling mice. In the absence of any cytopathic effect up to the day 7, a blind passage was created which was later tested on day 14 by indirect immunofluorescence test against polyclonal antibodies to dengue 1-4.⁴ Positives were then tested against monoclonal antibodies to dengue 1-4. Mice were observed for pathological signs during 21 days.

RESULTS

Eleven acute febrile human cases occurred during the survey period, of which 4 were confirmed by isolation of DEN 1 virus, and 2 by MAC ELISA. As per epidemiological evidences, they were all probably autochthonous. Specimens of *Ae. aegypti* (37) and *Ae. albopictus* (200) were inoculated (23 and 38 pools, respectively). One isolate of DEN 1 virus was obtained from 1 pool of 2 female *Ae.*

aegypti. No isolation was obtained from females of *Ae. albopictus* or males of either species or from any other species of mosquitoes (1073 ind.; 158 pools), despite the active circulation of DEN 1 virus and close association between viremic people and mosquitoes.

DISCUSSION

As suggested by recent studies in the state of Minas Gerais and former experimental transmission studies, *Ae. albopictus* may be considered as a probable vector of dengue 1, capable of getting infected and transmitting dengue viruses to its progeny. The present findings have not showed an association of these mosquitoes with man-to-man transmission of dengue in Brazil, despite the concomitant transmission of dengue 1 by *Ae. aegypti*. In the state of Espírito Santo, no dengue virus has been isolated from male or female mosquitoes bred from immature stages, suggesting that vertical transmission probably did not occur at the ending phase of this epidemic. Such negative results do not exclude the possibility of this mosquito to become an efficient vector of dengue or other arboviruses in the future.³

ACKNOWLEDGEMENTS

To Nilson dos Santos Will, Everaldo Binda, Agenor Barbosa de Oliveira, Jones Evandro de Oliveira, Homero de Oliveira Almeida, Geraldo de Moura Leite Filho da Secretaria Estadual de Saúde and Fundação Nacional de Saúde, Vitória, ES, for their collaboration during the field part of the work.

REFERENCES

1. Forattini OP. Identificação de *Aedes (Stegomyia) albopictus* (Skuse) no Brasil. *Rev Saúde Pública* 1986;20:244-5.
2. Marques CC de A, Marques GRA, Dégallier N. Is *Aedes albopictus* only a pest mosquito or also a vector of arboviruses in Brazil? In: Travassos da Rosa APA, Vasconcelos PFC, Travassos da Rosa, JFS, editors. *An overview of arbovirology in Brazil and neighbouring countries*. Belém: Instituto Evandro Chagas; 1998. p. 248-60.
3. Mitchell CJ. Vector competence of North and South American strains of *Aedes albopictus* for certain arboviruses: a review. *J Amer Mosq Control Ass* 1991;7:446-51.
4. Travassos da Rosa APA, Travassos da Rosa ES, Travassos da Rosa JFS, Dégallier N, Vasconcelos PF da C, Rodrigues SG. *Os arbovírus no Brasil: generalidades, métodos e técnicas de estudo*. Belém: Instituto Evandro Chagas; 1994. (Documento técnico n. 2).