



Cartagena, Colombia 3 al 6 OCTUBRE 2024

Abordando la interfaz humano-animal-entorno en la prevención de enfermedades tropicales

Eder Cano Pérez

Biólogo, M.Sc. Estudiante Doctorado en Medicina Tropical

Grupo de Investigación UNIMOL, Facultad de Medicina, Universidad de Cartagena

Enfermedades Tropicales

Virus



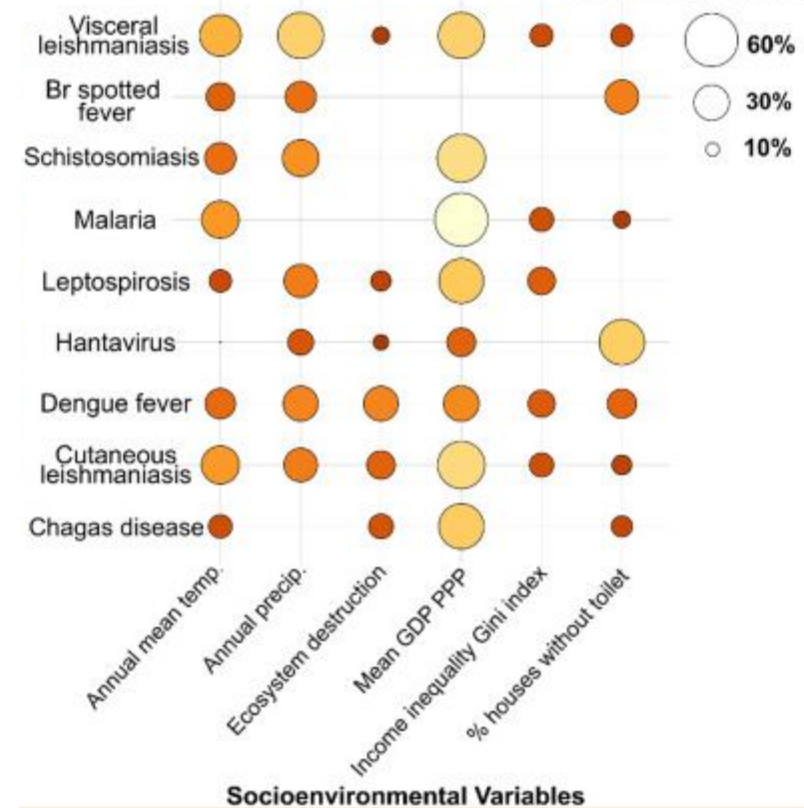
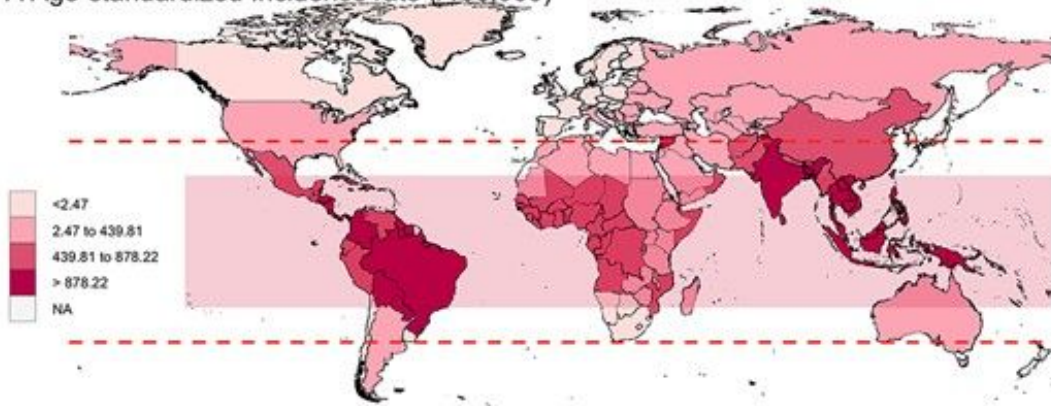
Bacterias



Parásitos

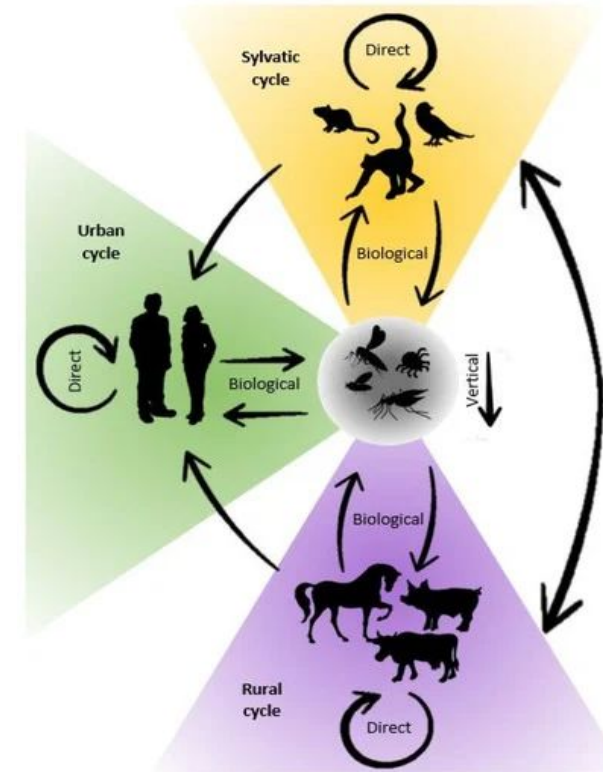


A Age-standardized Incidence rate (/100,000)

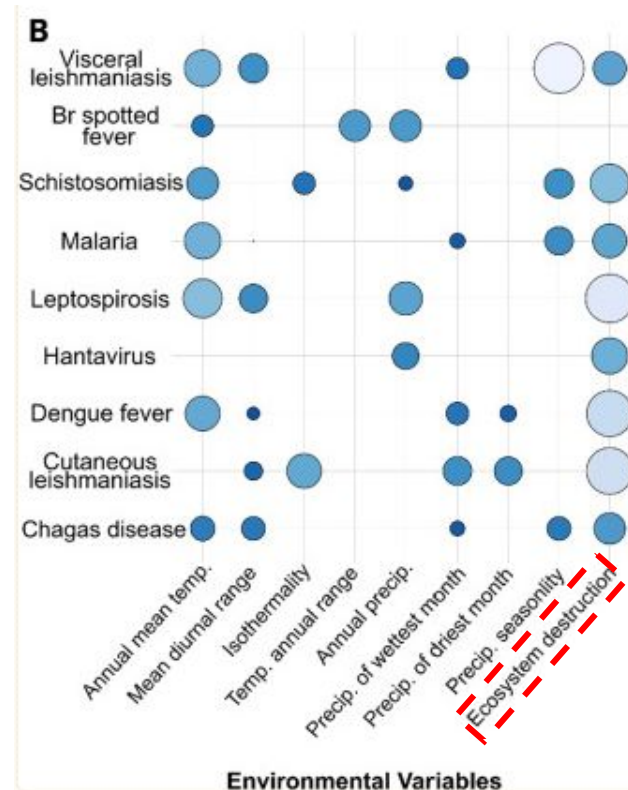
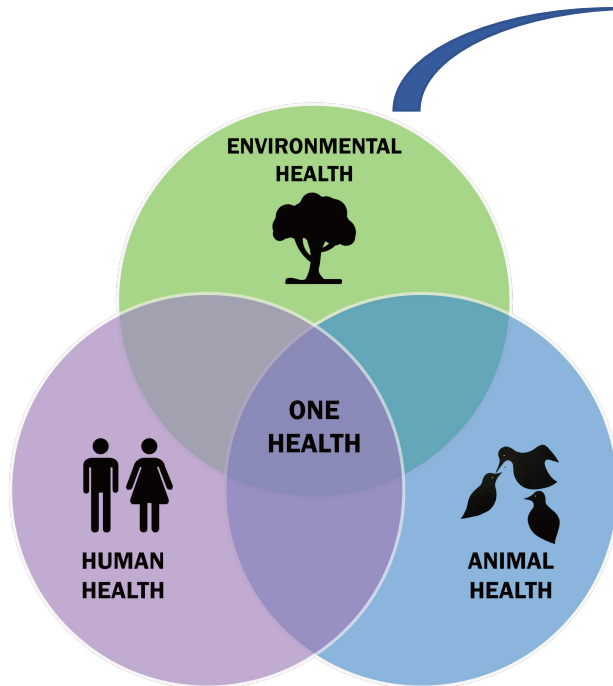


Enfermedades transmitidas por artrópodos mas comunes en las américas

| Disease | Vector | Pathogen | Transmission | Wild/Domestic reservoirs |
|-------------------------|------------------------------|--|--|--------------------------------------|
| Dengue fever | <i>Aedes</i> genus | Dengue virus | Vector transmission | ? ¹ |
| Malaria | <i>Anopheles</i> genus | <i>Plasmodium</i> sp. | Vector transmission | Wild non-human primates ² |
| Chagas disease | Triatominae bugs | <i>Trypanosoma</i> sp. | Oral transmission Vector transmission | Wild mammals |
| Leishmaniasis | Phlebotominae sandflies | <i>Leishmania</i> sp. | Vector transmission | Wild and domestic mammals |
| Brazilian spotted fever | <i>Amblyomma</i> genus ticks | <i>Rickettsia rickettsii</i> parasitizing a cell | Vector transmission | Wild and domestic mammals |

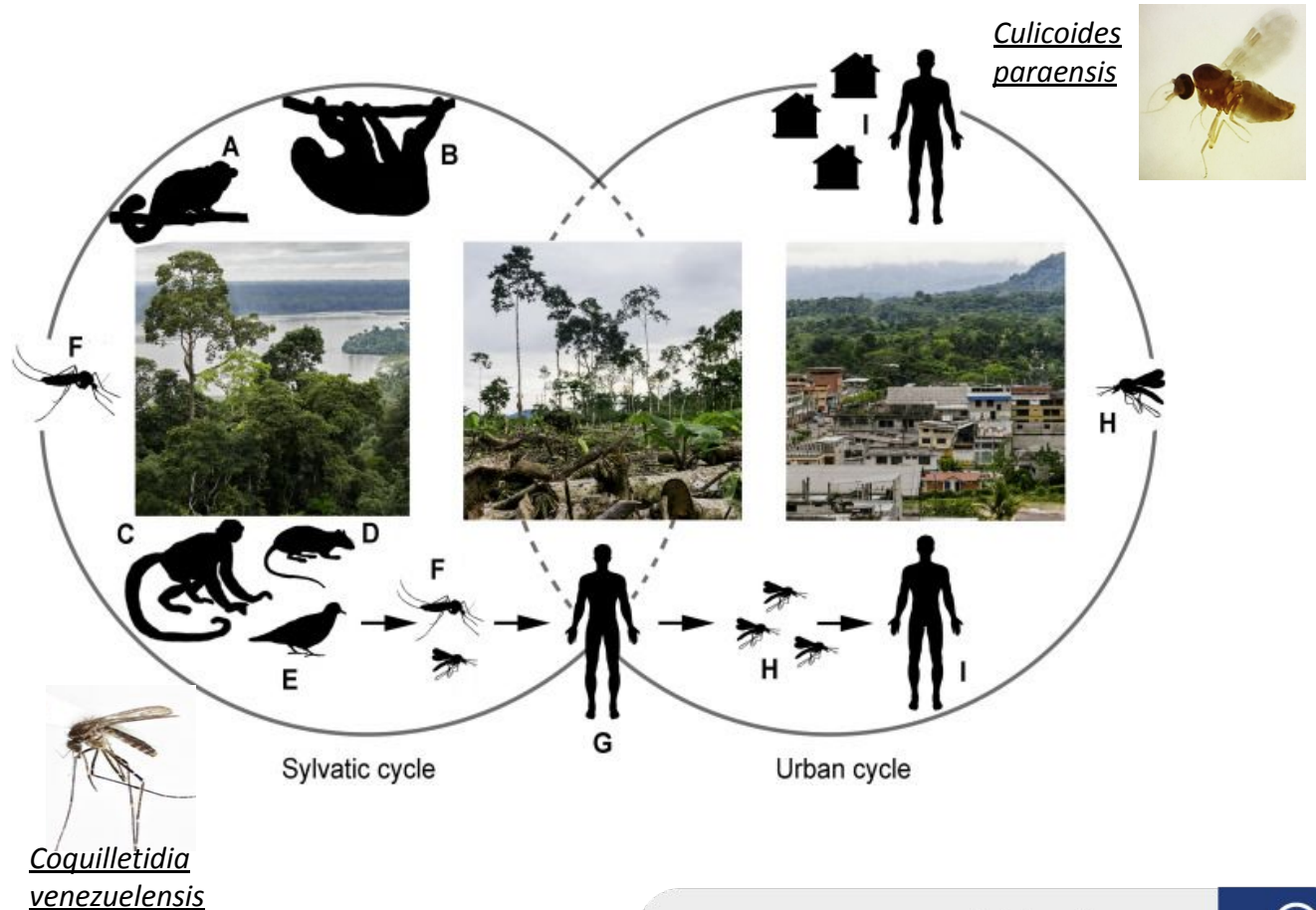
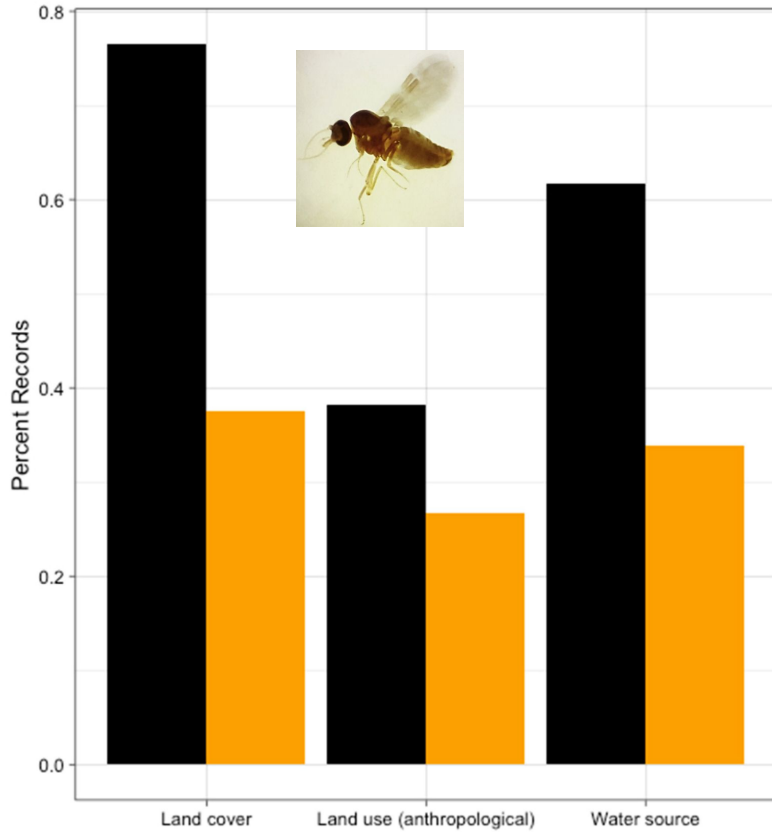


Humano - animal - entorno



Humano - animal - entorno

Virus Oropouche



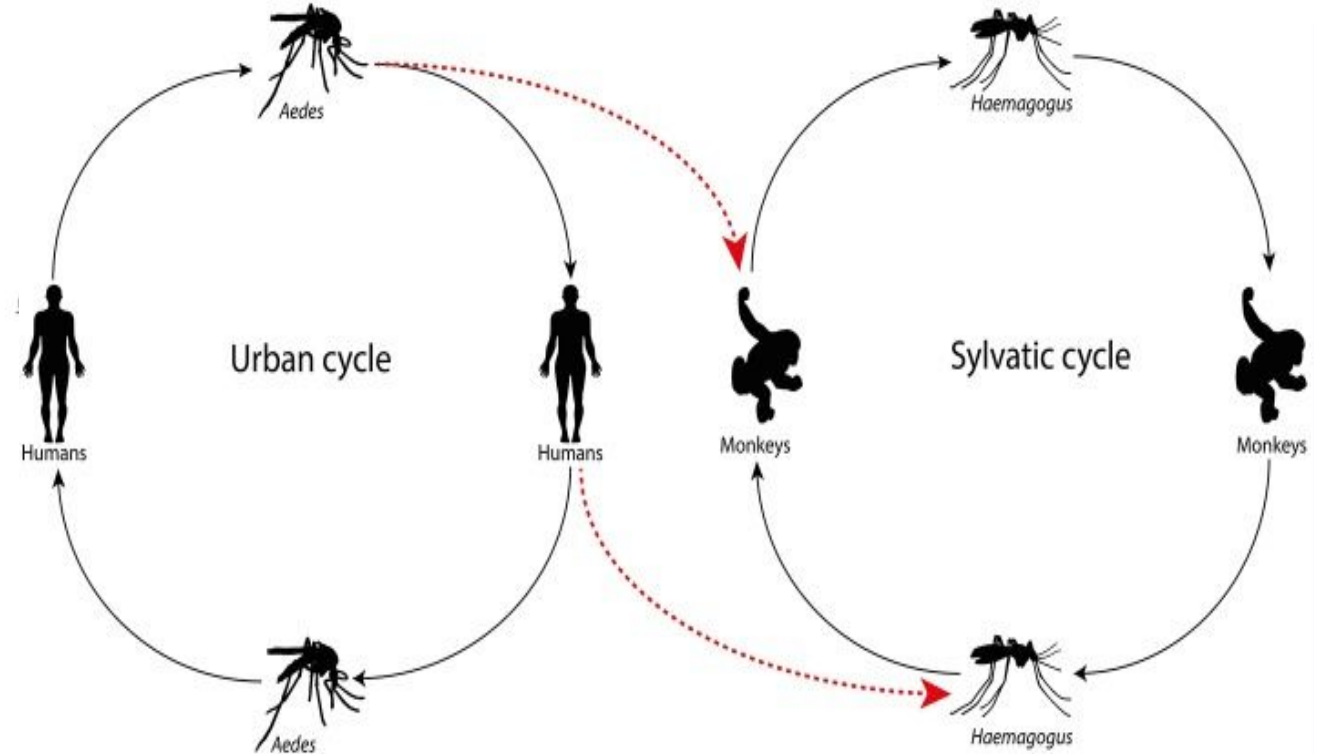


Human Urban Arboviruses Can Infect Wild Animals and Jump to Sylvatic Maintenance Cycles in South America

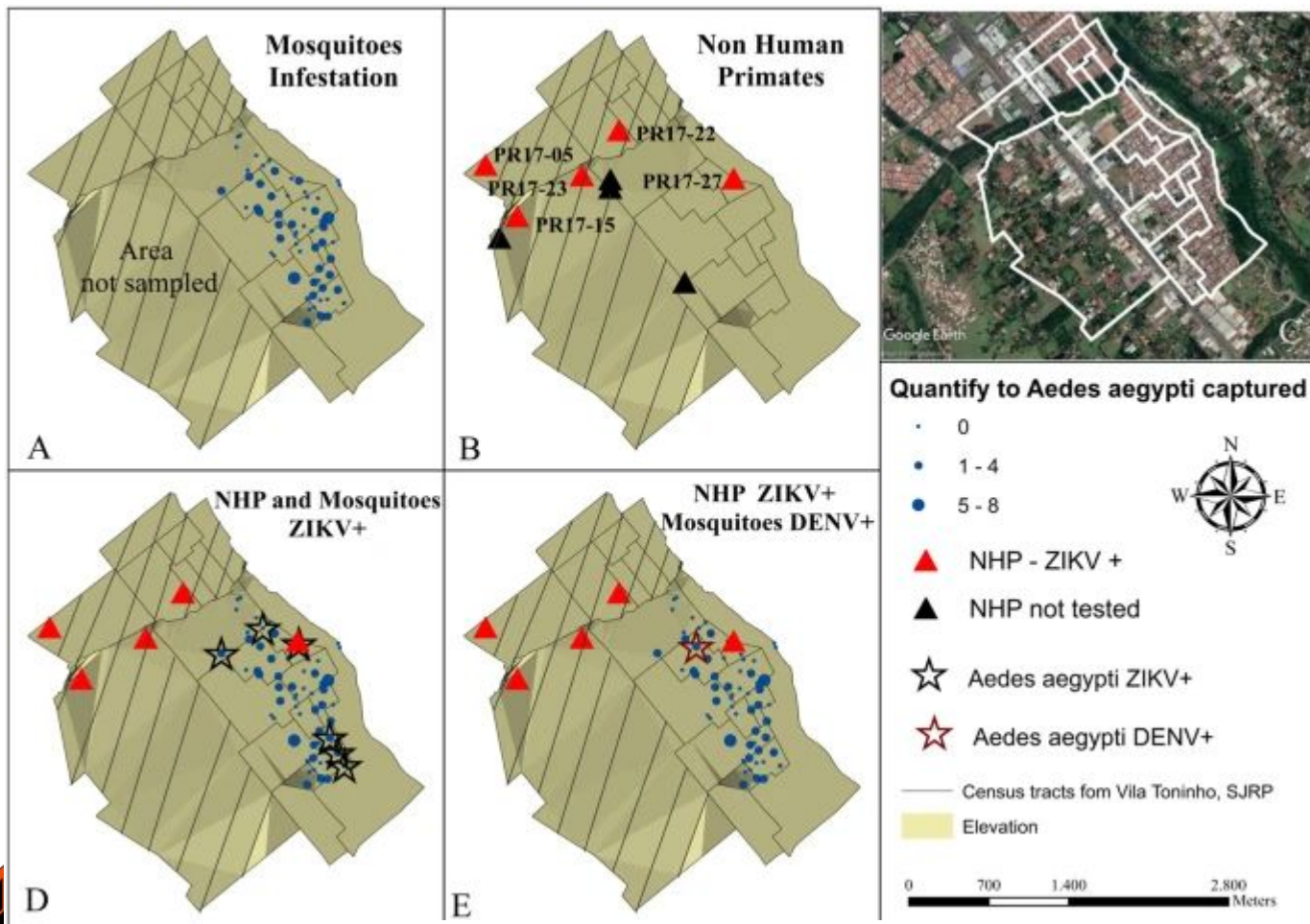
Luiz Tadeu Moraes Figueiredo*

School of Medicine, University of São Paulo, São Paulo, Brazil

Humano - animal - entorno

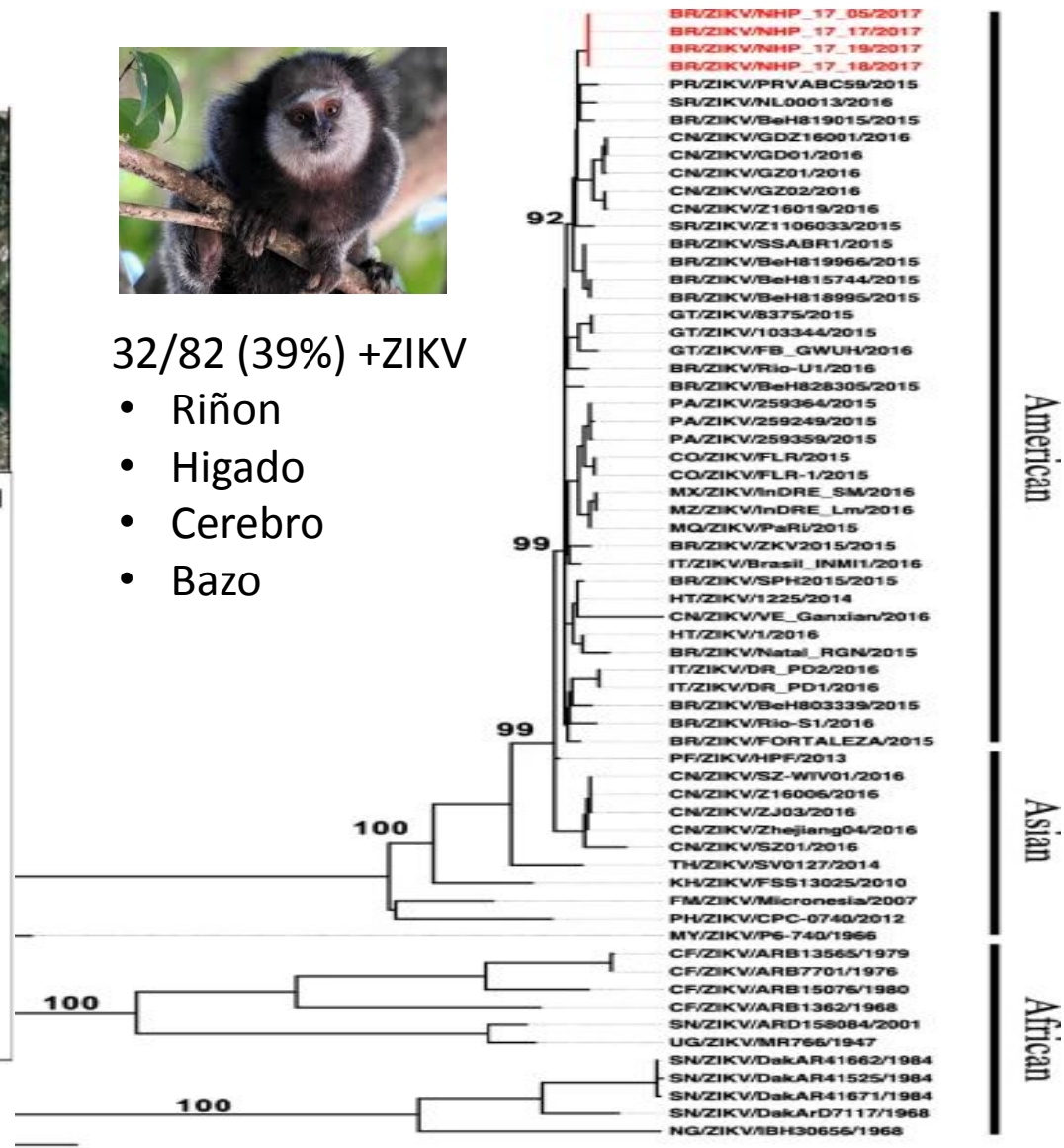


Humano - animal - entorno



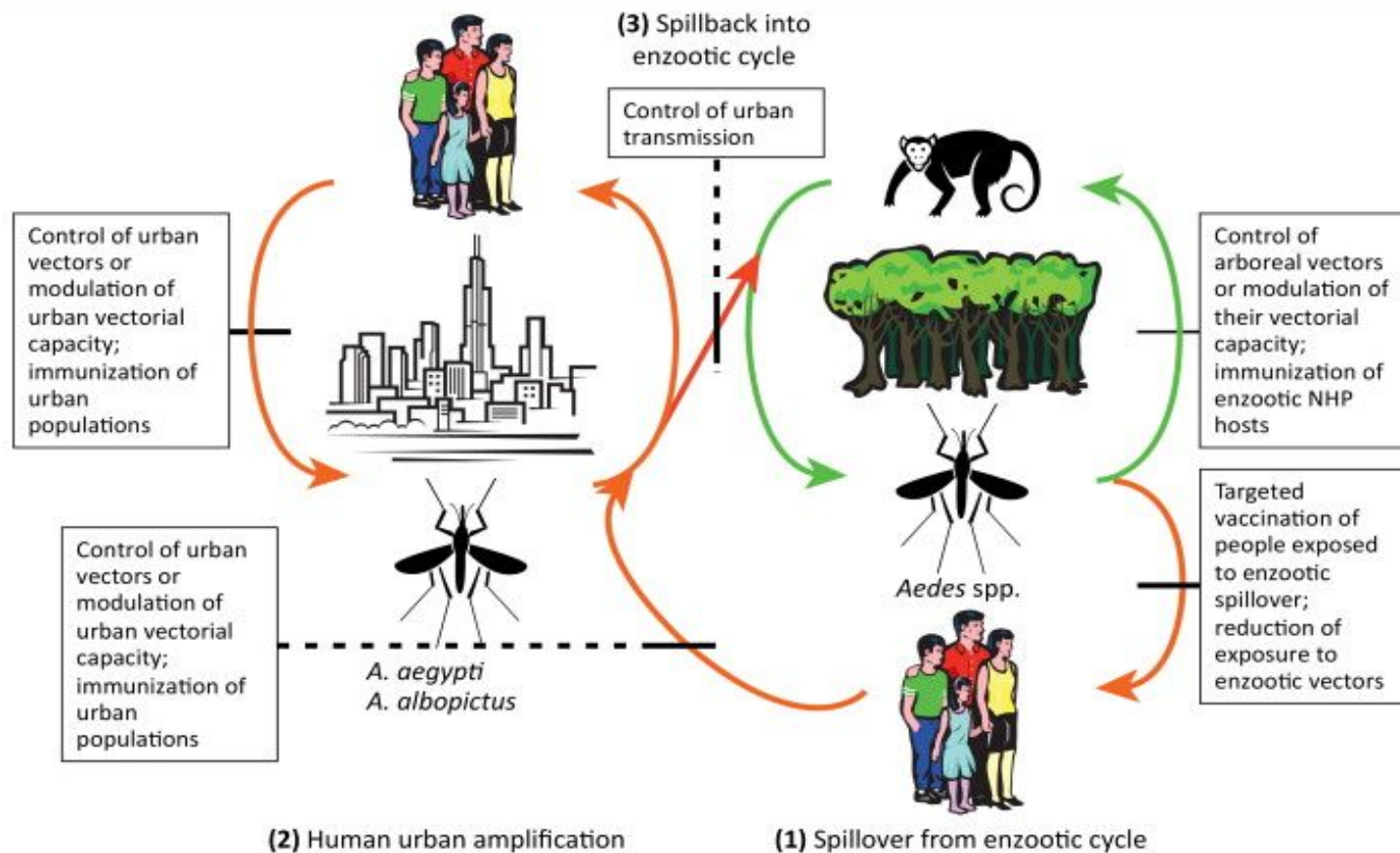
32/82 (39%) +ZIKV

- Riñon
- Hígado
- Cerebro
- Bazo



Barrio (Vila Toninho) de São José do Rio Preto, Brasil

Estrategias de prevención



Investigaciones locales



Article

Prevalence of Mosquito Populations in the Caribbean Region of Colombia with Important Public Health Implications

Eder Cano-Pérez ^{1,*}, Martha González-Beltrán ¹, Julia S. Ampuero ², Doris Gómez-Camargo ^{1,3}, Amy C. Morrison ⁴ and Helvio Astete ²

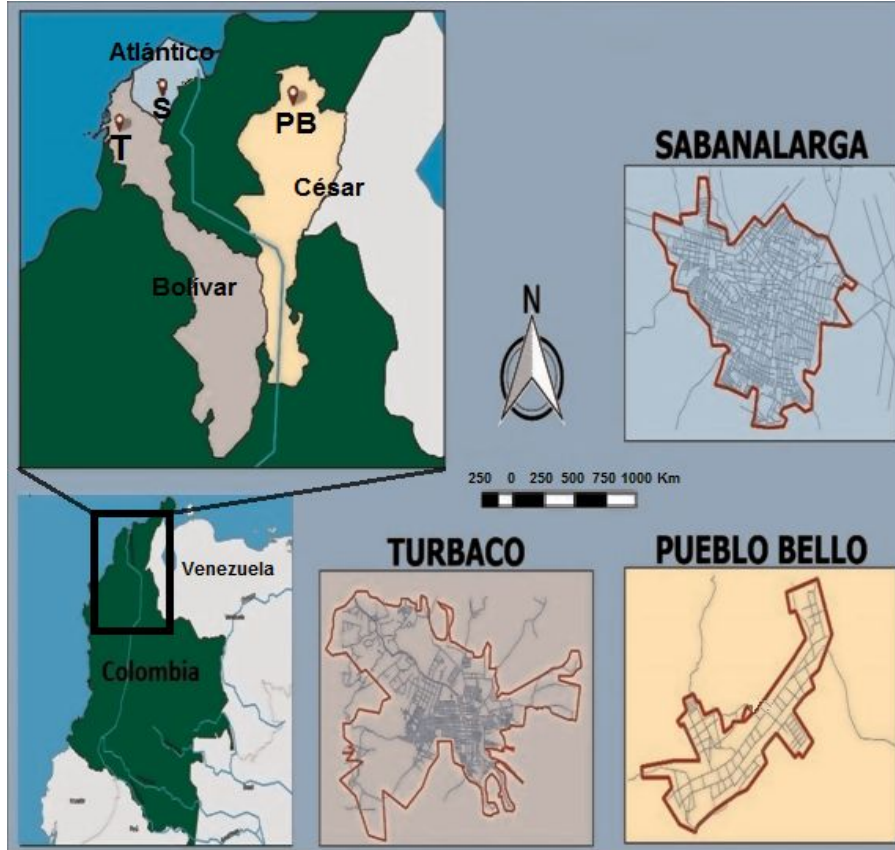
- ¹ Molecular Research Unit (UNIMOL), Faculty of Medicine, University of Cartagena, Cartagena de Indias 130014, Colombia
 - ² U.S. Naval Medical Research Unit No. 6, NAMRU-6, Lima 15001, Peru
 - ³ PhD Program in Tropical Medicine, Faculty of Medicine, University of Cartagena, Cartagena de Indias 130014, Colombia
 - ⁴ Department of Pathology, Microbiology, and Immunology, School of Veterinary Medicine, University of California Davis, Davis, CA 95616, USA
- * Correspondence: ecanop@unicartagena.edu.co; Tel.: +57-3006741092



Investigaciones locales

Métodos de colecta

- a) Tres trampas CDC de luz (rural)
- b) Trampa Shannon (rural)
- c) Cebo humano (rural)
- d) Aspiración mecánica Prokopack (domicilios; periurbano)



a



b



c



d

Resultados



Cartagena, Colombia 3 al 6 OCTUBRE 2024

- 11,566 mosquitos
- Dos subfamilias, 13 géneros, y 63 especies fueron identificadas

Table 1. Ecological indices established in the forest fragments of the municipalities of Turbaco, Sabanalarga and Pueblo Bello.

| Municipalities | Ecological Diversity Indices | | | |
|----------------|------------------------------|----------|--------|---------|
| | Shannon | Margalef | Pielou | Simpson |
| Turbaco | 2.39 | 5.40 | 0.62 | 0.15 |
| Sabanalarga | 2.67 | 5.11 | 0.70 | 0.10 |
| Pueblo Bello | 1.48 | 5.09 | 0.39 | 0.43 |

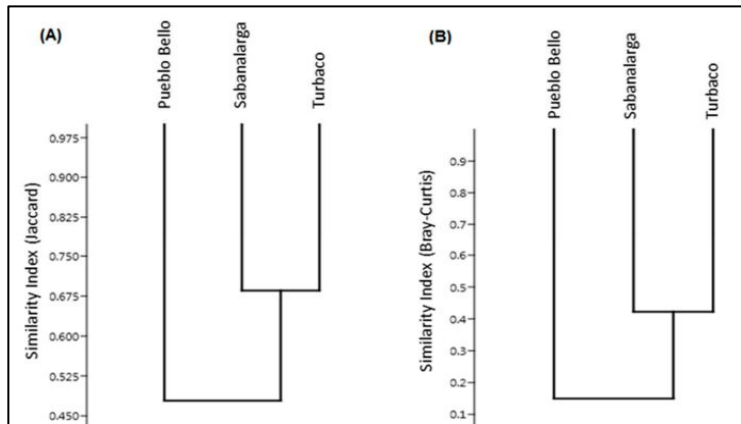
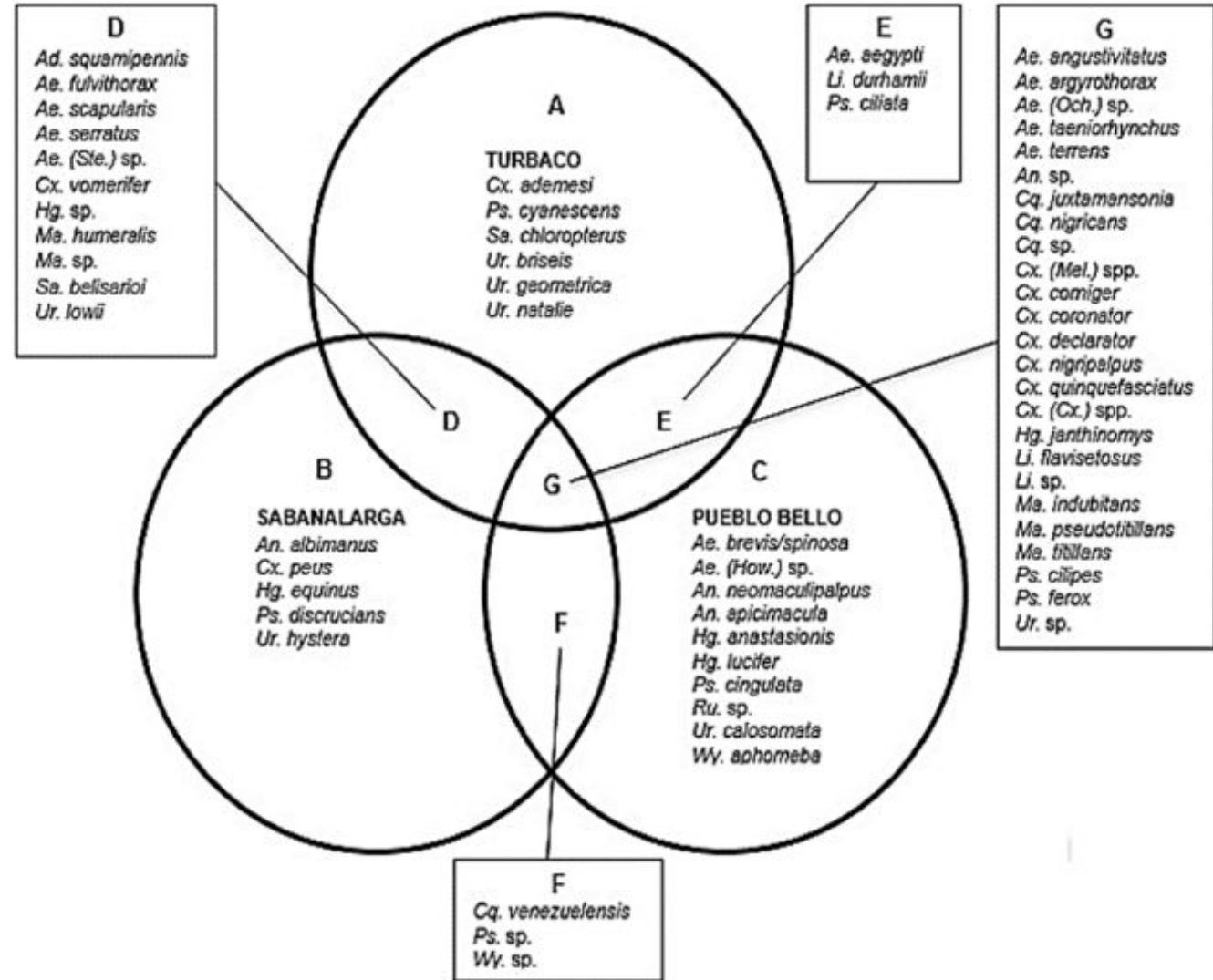


Figure 3. Species similarity dendrograms. (A) Jaccard index. (B) Bray-Curtis index.

Investigaciones locales



Investigaciones locales



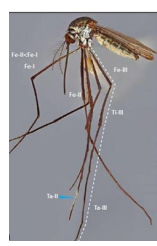
Aedes



Culex



Haemagogus



Sabethes

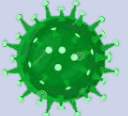
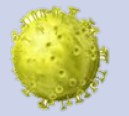
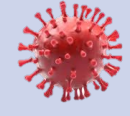
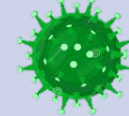
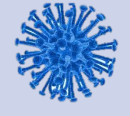

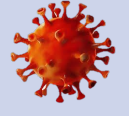
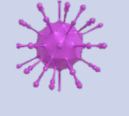



Psorophora



Anopheles



| Orthoflavivirus | | Alfavirus | | Orthobunyavirus | Protozoarios y nematodos |
|--|--|--|--|--|---|
|  DENV - ZIKV |  YFV |  MAYV |  CHIKV |  OROV |  <i>Plasmodium sp.</i> |
|  WNV | |  VEEV - EEEV - WEEV | | |  <i>Dirofilia immitis</i> |



Resultados

Investigaciones locales



Cebo humano

52,45% (n = 5509); 54 especies



Trampas CDC

45,07% (n = 4734); 47 especies



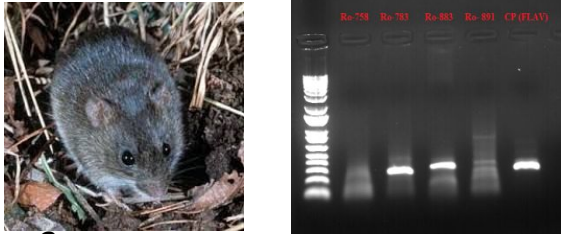
Trampa Shannon

2,47% (n = 260); 29 especies


Table 2. Frequency of houses inspected with adult forms of *Ae. aegypti*.

| Municipalities | Houses Inspected | Number of Houses with Adult Forms of <i>Ae. aegypti</i> | Infestation Index by <i>Ae. aegypti</i> (%) | Number of Individuals Collected | Adult Density (Ind/House) |
|----------------|------------------|---|---|---------------------------------|---------------------------|
| Turbaco | 49 | 21 | 42.85 | 246 | 5.02 |
| Sabanalarga | 32 | 12 | 37.50 | 51 | 1.59 |
| Pueblo Bello | 44 | 17 | 38.63 | 105 | 2.39 |
| Total | 125 | 50 | 40.00 | 402 | 3.21 |


Sabanalarga




Oryzomys sp.

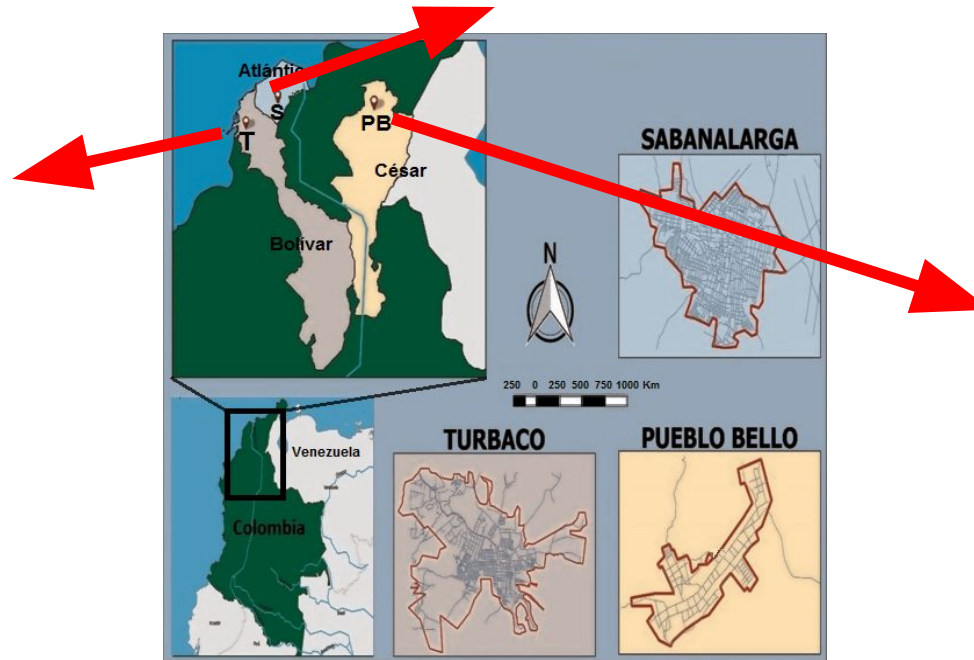
DENV-3 

Turbaco

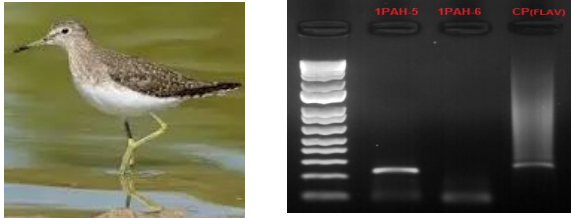


Cx. quinquefasciatus


DENV-3 



Pueblo Bello



Tringa solitaria

Flavivirus 





Referencias

Yushi Lin, Kailu Fang, Yang Zheng, Hong-liang Wang, Jie Wu, Global burden and trends of neglected tropical diseases from 1990 to 2019, Journal of Travel Medicine, Volume 29, Issue 3, April 2022, taac031, <https://doi.org/10.1093/jtm/taac031>

Magalhães AR, Codeço CT, Svenning JC, Escobar LE, Van de Vuurst P, Gonçalves-Souza T. Neglected tropical diseases risk correlates with poverty and early ecosystem destruction. Infect Dis Poverty. 2023 Apr 10;12(1):32. doi: 10.1186/s40249-023-01084-1

Mónica Izquierdo-Suzán, Paula B. Zavala-Guerrero, Hugo Mendoza, Renato Portela Salomão, Mauricio Vázquez-Pichardo, Juan José Von Thaden, Rodrigo A. Medellín, Mosquito (Diptera: Culicidae) diversity and arbovirus detection across an urban and agricultural landscape, Acta Tropica, Volume 257, 2024, 107321,

Walsh, C.E.S.; Robert, M.A.; Christofferson, R.C. Observational Characterization of the Ecological and Environmental Features Associated with the Presence of Oropouche Virus and the Primary Vector Culicoides paraensis: Data Synthesis and Systematic Review. Trop. Med. Infect. Dis. 2021, 6, 143.

Benoît de Thoisy, Vincent Lacoste, Adeline Germain, Jorge Muñoz-Jordán, Candimar Colón, Jean-François Mauffrey. Dengue Infection in Neotropical Forest Mammals. Vector-Borne and Zoonotic Diseases 2009 9:2, 157-170

Figueiredo LTM. Human Urban Arboviruses Can Infect Wild Animals and Jump to Sylvatic Maintenance Cycles in South America. Front Cell Infect Microbiol. 2019 Jul 17;9:259.

Terzian, ACB, Zini, N., Sacchetto, L. et al. Evidencia de infección natural por el virus del Zika en primates no humanos neotropicales en Brasil. Sci Rep 8 , 16034 (2018). <https://doi.org/10.1038/s41598-018-34423-6>

Guth S, Hanley KA, Althouse BM, Boots M (2020) Ecological processes underlying the emergence of novel enzootic cycles: Arboviruses in the neotropics as a case study. PLOS Neglected Tropical Diseases 14(8): e0008338. <https://doi.org/10.1371/journal.pntd.0008338>





Referencias

Guth S, Hanley KA, Althouse BM, Boots M (2020) Ecological processes underlying the emergence of novel enzootic cycles: Arboviruses in the neotropics as a case study. PLOS Neglected Tropical Diseases 14(8): e0008338. <https://doi.org/10.1371/journal.pntd.0008338>

Scott C. Weaver, Urbanization and geographic expansion of zoonotic arboviral diseases: mechanisms and potential strategies for prevention, Trends in Microbiology, Volume 21, Issue 8, 2013, Pages 360-363,



Muchas gracias



Cartagena, Colombia 3 al 6 OCTUBRE 2024

