

ICRAMCS 2026

THE EIGHTH EDITION OF THE INTERNATIONAL CONFERENCE ON
RESEARCH IN APPLIED MATHEMATICS AND COMPUTER SCIENCE

April 23-24-25, 2026 | Marrakech, Morocco



On the Dynamics of Sexual and Vectorial Transmission of Zika Virus

Communication Info

Authors:

Pedro Pablo CÁRDENAS A.¹

¹ Universidad Tecnológica de
Pereira and GEDNOL, Pereira,
Colombia

Keywords:

- (1) ZIKA virus
- (2) Sexual-Vectorial
transmission
- (3) Vector-borne diseases

Abstract

The Zika virus epidemic highlighted the limitations of classical vector-borne disease models by revealing the epidemiological relevance of sexual transmission [1]. This talk presents an analytical examination of a mathematical model describing the combined sexual and vectorial transmission of Zika virus, formulated within an extended Ross–Macdonald framework and based on a system of nonlinear ordinary differential equations [2].

The presentation focuses on a detailed interpretation of the model structure, underlying assumptions, and dynamical behavior. We discuss the role of key parameters governing sexual transmission [3], analyze the stability of disease-free and endemic equilibria, and examine the decomposition of the basic reproduction number in terms of vectorial and sexual transmission pathways.

Rather than introducing new results, this contribution emphasizes a critical reading of the model, highlighting its strengths, limitations, and implicit assumptions [4]. Possible extensions, including behavioral effects, temporal variability, and more refined population structures, are briefly discussed as open directions for future research [5].

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