

ORT_16 - Arbovirus detection in endemic regions of Minas Gerais/Brazil: Importance of Molecular ZC-D Typing Bio-Manguinhos as tool for epidemiological surveillance

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Introduction: Arboviruses cause serious public health disorders in Brazil and in many countries inside the tropical zone. Detection through molecular techniques becomes important, not only for obtaining epidemiological data, as well as targeting treatments. The ZC-D Typing Bio-Manguinhos Molecular Kit is a RT-PCR technology based and consists of three distinct triplex reactions that detect and differentiate ZIKV, CHIKV and DENV 1, 2, 3 and 4 serotypes. Clinical samples [PHC1] were evaluated in an epidemiological study of circulating arboviroses.

Objectives: The aim of the study was to evaluate clinical samples from an endemic region for arboviruses in the state of Minas Gerais, Brazil.

Methodology: A total of 99 clinical samples from Minas Gerais state (Brazil), collected in February 2023, were tested. The nucleic acid extraction and qPCR steps were performed at the Laboratory of Integrative Biology, Department of Genetics, Ecology and Evolution, Institute of Biological Sciences, UFMG. The RT-PCR reaction was performed according to the instructions for the Bio-Manguinhos Molecular Kit ZC-D Typing kit. For Each clinical sample tested, negative and positive controls were amplified in three distinct multiplex RT-PCR reaction. The evaluation of the results was carried out using the Design and Analysis software (Thermo Fisher) version 2.6.0.

Results: Among the 99 samples evaluated with the Molecular Assay, 9 (9%) were detected for DENV-1. These same samples were previously positive when tested for NS1 Antigen with Dengue NS1 Ag 20 Cassettes kit (ABBOTT). In additional, 16 samples (16%) were detected for the CHIKV. 74 samples (75%) were not detected for ZIKV, DENV-2, DENV-3 and DENV-4, when evaluated with the molecular kit and negative for the NS1 antigen. In a previous epidemiological study, carried out in May 2022, the ZC-D Typing kit was used in the evaluation of 15 symptomatic samples, without previous diagnosis. 13 samples (86%) were detected for DENV-11 and 2 for DENV-2.

Conclusion: The data obtained by UFMG in 2023, demonstrate a high number of confirmed Chikungunya cases. The second most frequent arbovirus is DENV-1. The detection of DENV-2 in 2022, by ZC-D Typing kit, was immediately notified to the Minas Gerais state Health Department, since DENV-2 cases were not confirmed yet. This epidemiological evaluation demonstrates the effectiveness of using the molecular kit in discriminating and confirming the arboviruses responsible for epidemiological outbreaks, guiding public health policies.

Keywords: Arbovirus, Molecular Biology, Epidemiological Surveillance