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## Effect of 4-nerolidilcatecol of *Pothomorphe umbellata* in the chromosomes of *Aedes aegypti* from Manaus, Amazonas State

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### ABSTRACT

**Introduction:** *Aedes aegypti* is a mosquito with significant importance for public health, due to its vector competence for arbovirus transmission. Among these, the most important in Brazil are the viruses that cause Dengue, Yellow Fever and Chikungunya Fever. Natural plant-based compounds have been shown to be new alternatives for controlling medically important insect vectors with known resistance to synthetic insecticides. **Objective:** To determine the toxic and genotoxic effects of 4-nerolidilcatechol (4-NC) from *Pothomorphe umbellata* on larvae and adult females of *A. aegypti*. **Material and Methods:** third instar larvae of *Ae. aegypti* obtained from pre-established colonies in an Insectary, after collection of immature forms in the Aleixo neighborhood, Manaus, Amazonas state, were exposed to different concentrations (10, 30, 50, 70, 90 and 110 µg/mL of 4-NC) and to negative control - CN (water + DMSO at 0.02), for 24 hours (bioassay of toxicity) and at 40 and 60 µg/mL of 4-NC, for 4 hours (bioassay of genotoxicity). Then, slides of brain ganglia were made to obtain mitotic chromosomes, and later, slides of adult female oocytes (meiotic chromosomes), both by the scattering method, followed by visualization under a light microscope and statistical analysis to determine the mortality of larvae, frequency of nuclear anomalies and oviposition rate of treated females. **Results and Discussion:** the toxicological assay showed 100% mortality of 3rd instar larvae of *Ae. aegypti* submitted to 110 concentration of 4-NC. At the cellular level, there was a significant increase in the frequency of nuclear anomalies in the interphase chromosomes of this mosquito, such as micronucleus formation, budding, polynucleated cells and other malformations compared to the negative control, being proportional to the increase in the concentration used in treatments with 4-NC. It was also observed a decrease in the average oviposition of females followed along G<sub>1</sub>. The determination of the Lethal Concentration was the main parameter used to verify the larvicidal effect of new compounds. In this study, there was a significant difference (p>0.05) in the frequency of chromosomal anomalies in relation to CN. In G<sub>1</sub>, the genome damage of *Ae. aegypti* exposed to 4-NC was associated with a slight decline in fertility in females exposed to the compound for 4 hours, according to mean oviposition data. **Conclusion:** The results showed a sensitivity of *Ae. aegypti* to the compound 4-NC, but further studies will be needed to clarify the specific mechanisms of action of this compound when applied directly in the field, aiming to obtain data on the efficiency of this substance in the control of *Ae. aegypti*.

**KEYWORDS:** Cytogenetics; Biological Control; Caapeba

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