



Potential control of *Aedes aegypti* (Diptera: Culicidae) with *Piper aduncum* L. (Piperaceae) extracts demonstrated by chromosomal biomarkers and toxic effects on interphase nuclei

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ABSTRACT. Dillapiol, a phenylpropanoid isolate from essential oils of leaves of *Piper aduncum* (Piperaceae), has insecticidal, fungicidal and antimicrobial activities. The insecticidal activity of dil-

lapiol was tested *in vivo* on the larvae and pupae of *Aedes aegypti*, the mosquito vector of dengue. Specifically, the effect of dillapiol on the formation of micronuclei and chromosome aberrations was analyzed. Dillapiol treatments comprised two concentrations of 200 and 400 $\mu\text{g}/\text{mL}$, dissolved in well water, and a pure well water control used to rear four generations of mosquitoes. Micronuclei occurred in mitotic diploid and tetraploid chromosomes of larvae; nuclear abnormalities also occurred in interphase, metaphase, telophase, and single nucleus cells of pupae. Mortality, oviposition, chromosome breakage, and anaphase bridges were significantly greater in the extract treatments than in controls. The genotoxic effects of dillapiol described here suggest that this natural product may be a useful alternative for the control of *A. aegypti*.

Key words: Dengue; Dillapiol; Micronucleus test; Chromosome aberrations