Indian Journal of Experimental Biology
Vol. 62, December 2024, pp. 949-957
DOI: 10.56042/ijeb.v62i12.7049

Cytotoxic and genotoxic effects of Bendiocarb on MDA-MB-231 cell line

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Received 01 December 2023; revised 01 August 2024

This study aims to evaluate the cytotoxic and genotoxic effects of bendiocarb on MDA-MB-231 breast cancer cells using *in vitro* tests. The cytotoxic effects of bendiocarb on cells were measured using the XTT assay, and cytotoxic doses causing half and complete cell death were determined to be between 10 µg/mL and 100 µg/mL. In this study, genotoxic damage in cells, including comet tail length, tail moment, and DNA percentage, was statistically evaluated using the comet assay. Additionally, apoptotic tests and immunocytochemistry were performed to morphologically and molecularly determine bendiocarb induced apoptosis and related pathways. DNA polymorphisms were analyzed using the RAPD-PCR test to detect changes in bands. PI3K-Akt-mTOR signalling pathway was examined at the molecular level, showing positive regulation of antibodies visually. Genetic investigations, conducted through the comet assay and RAPD-PCR test, allowed the examination of the genotoxic effects of pesticides on breast cancer using statistical and visual data. Bendiocarb pesticide was found to induce cytotoxic and genotoxic effects on breast cancer cells at specific doses, leading to cell demise by damaging DNA and causing cellular injury. Cellular death pathways were determined and the detrimental impacts of the pesticide on cells were revealed through molecular investigations.

Keywords: Pathways, DNA damage, Apoptosis, Insecticide