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The Cancer Control Challenge:
Better Understanding It to Better Face It

EVALUATION OF THE ACTIVITY OF AN ESSENTIAL OIL IN TWO DIFFERENT GASTRIC CANCER CELL LINES

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Introduction: Gastric cancer (GC) is the fifth most common type of cancer worldwide, according to the International Agency for Research on Cancer. It is characterized by a high incidence, poor prognosis, and resistance to conventional treatments, making it a global health problem. In the northern region of Brazil, GC ranks as the second most common cancer among men and the fifth among women, according to the National Cancer Institute. In this context, the use of natural products has emerged in the scientific field as a form of alternative therapy, due to their significant medicinal properties, especially anti-inflammatory, anti-proliferative, and antineoplastic activities, making the investigation of the antineoplastic potential of widely used Amazonian species a promising approach. **Objectives:** To evaluate the in vitro antineoplastic effect of an essential oil derived from the *Piperaceae* family on two gastric tumor cell lines: AGP-01 and AGP-01 *PIWI* Knockout(*-/-*). **Methods:** The AGP-01, AGP-01 *PIWI-/-*, and non-neoplastic HEK-293 cell lines were cultured in DMEM supplemented with 10% fetal bovine serum and 1% antibiotics, and maintained in an incubator at 37°C with a 5% CO_2 atmosphere. To evaluate the substance's effect on cell viability, the MTT assay, an in vitro cytotoxicity technique used in tumor cells, was performed. Cells were plated in 96-well plates at a concentration of 3 x 10^3 cells/well. The essential oil was dissolved in dimethyl sulfoxide (DMSO) to obtain an initial concentration of 15mg/mL, and treatments were performed using a concentration gradient ranging from 100 to 1.56µg/mL, maintained for 72 hours in a CO_2 incubator. After treatment, the supernatant was aspirated, followed by the addition of 100 µL of MTT solution at 0,5mg/mL, and incubation for 3 hours. Finally, the supernatant was aspirated, and the formazan crystals were resuspended in 100µL of DMSO, allowing the analysis in a plate spectrophotometer at a wavelength of 570nm. **Results:** The half-maximal inhibitory concentration (IC_{50}) values after 72 hours of treatment were 13.82µg/mL for the AGP-01 line and 7.55µg/mL for the AGP-01 *PIWI-/-* line. The non-neoplastic HEK-293 line showed an IC_{50} higher than 100µg/mL, indicating only a slight reduction in cell

metabolism at the highest treatment concentrations, and demonstrating low cytotoxic activity when compared to the tumor cell lines. **Conclusion:** The results demonstrate that the oil exhibits significant cytotoxic activity against the analyzed cell lines, based on the IC_{50} values mentioned above. The increased sensitivity observed in the AGP-01 *PIWI-/-* line suggests that the absence of *PIWIL1* gene expression may render the cells more susceptible to the compound's effect, indicating a potential therapeutic strategy in such cases. These findings reinforce the therapeutic potential of the compound and highlight the importance of further investigation into natural products from the Brazilian Amazon region.

Keywords: Gastric Cancer; Natural products; *Piperaceae*;