

EVALUATION OF THE CYTOTOXIC POTENTIAL OF A GEOPROPOLIS ETHANOLIC EXTRACT IN DIFFERENT GASTRIC CANCER CELL MODELS

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Introduction: Gastric cancer (GC) is a global public health issue characterized by malignant transformation of the gastric epithelium. This disease can be classified into two main subtypes: diffuse, composed of poorly cohesive cells with high invasive potential, and intestinal, marked by glandular organization and slower tumor progression. Current GC treatment relies predominantly on chemotherapy; however, available regimens show limitations in selectivity and efficacy, underscoring the need for novel therapeutic strategies. In this context, natural products have gained prominence, including geopropolis, a substance produced by stingless bees and composed of propolis mixed with clay or soil. Tumor heterogeneity reinforces the importance of evaluating new pharmacological candidates across distinct cellular models, as molecular differences among subtypes may influence therapeutic response. **Objectives:** To evaluate the cytotoxic potential of a geopropolis ethanolic extract in three different gastric cancer cell models. **Methods:** AGP01 cells (metastatic gastric adenocarcinoma), ACP02 cells (diffuse gastric adenocarcinoma), ACP03 cells (intestinal gastric adenocarcinoma), and HEK-293 cells (non-neoplastic human embryonic kidney) were subjected to the MTT cell viability assay after 72 hours of treatment with concentrations of 100, 50, 25, 12.5, 6.25, 3.125, and 1.5625 µg/mL of a geopropolis ethanolic extract derived from *Melipona seminigra pernigra* (UBR). Dose–response curves were generated using nonlinear regression to determine the mean inhibitory concentration (IC₅₀), employing GraphPad Prism v9 software. Group comparisons were performed using one-way ANOVA followed by Bonferroni correction, with statistical significance set at $p < 0.05$. **Results:** The geopropolis extract from the UBR species demonstrated differential cytotoxic activity

among the evaluated cell lines, with IC50 values of 8.3 µg/mL for AGP01, 37.8 µg/mL for ACP02, 20.8 µg/mL for ACP03, and 22.2 µg/mL for HEK-293. Selective cytotoxicity was observed only in the metastatic AGP01 cell line. **Conclusion:** The geopropolis ethanolic extract from *Melipona seminigra pernigra* exhibited significant cytotoxic activity against gastric cancer cell lines, with selective effects restricted to metastatic cells. Nonetheless, the observed cytotoxicity in diffuse and intestinal adenocarcinoma models indicates relevant biological activity across different gastric cancer contexts. These effects may be related to the extract's chemical composition, which is rich in phenolic compounds and flavonoids with known antiproliferative, antioxidant, and pro-apoptotic properties. The findings support the potential of this extract as a candidate for antineoplastic drug development, while emphasizing the need for further studies to elucidate its mechanisms of action and assess safety and efficacy in preclinical models.

Keywords: Gastric cancer; geopropolis; treatment