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1174 – In vitro cytotoxicity and selectivity of *arrabidaea chica*, *pereskia aculeata*, *gossypium barbadense* and *zingiber officinale* against breast cancer cell lines

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Introduction: Breast cancer remains one of the leading causes of cancer-related mortality worldwide, highlighting the need for novel therapeutic agents with improved selectivity toward tumor cells. Natural products represent an important source of bioactive compounds with potential antitumor activity. This study aimed to evaluate the cytotoxic and selective effects of ethanolic extracts from medicinal plants against breast cancer cell lines.

Methods: An in vitro experimental study was conducted using human breast cancer cell lines MCF-7 (luminal subtype) and MDA-MB-231 (triple-negative subtype), along with non-tumoral cell lines for selectivity analysis. Ethanolic extracts of *Arrabidaea chica*, *Gossypium barbadense*, *Pereskia aculeata*, and *Zingiber officinale* were tested at concentrations ranging from 125 to 1,000 µg/mL. Cell viability was assessed by the MTT assay after 48h of treatment. IC₅₀ values were calculated using nonlinear regression, and the Selectivity Index (SI) was determined as the ratio between non-tumoral and tumor cell IC₅₀ values. Chemical characterization was performed by LC-HRMS/MS.

Results: *Arrabidaea chica* demonstrated the most promising antitumor profile, particularly in MCF-7 cells (IC₅₀=130 µg/mL), with a high selectivity index (SI>7), indicating preferential cytotoxicity toward tumor cells. *Gossypium barbadense* exhibited moderate cytotoxicity in both breast cancer cell lines, with limited selectivity. *Pereskia aculeata* failed to exhibit significant cytotoxic activity in tumor cells, while *Zingiber officinale* presented low to moderate antiproliferative effects with reduced selectivity. Differential sensitivity was observed between breast cancer subtypes, with MDA-MB-231 cells generally less responsive. Chemical analysis revealed the presence of phenolic acids and flavonoids, including gallic acid, caffeic acid, rutin, and quercetin.

Conclusion: The results highlight *Arrabidaea chica* as a promising source of bioactive compounds with selective cytotoxic activity against breast cancer cells. These findings support further studies focusing on compound isolation and mechanistic investigation, aiming at the development of more effective and selective anticancer therapies.

Ethics: In vitro study.

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Keywords: plant extracts; cytotoxicity tests; breast cancer.