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CITOTOXIC ACTIVITY SCREENING OF MARINE ORGANISMS ON HCT-116, MCF7 AND A549 CELL LINES

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Cancer is one of the main causes of mortality worldwide, with significant socioeconomic impact. Despite the advances obtained with conventional therapies, many types of neoplasms still demonstrate resistance, which reinforce the continuous need for new therapeutic approaches. In this scenario, marine organisms have stood out as relevant sources of promising bioactive secondary metabolites for the development of innovative antitumor agents. In this study, the cytotoxic activities of three cyanobacteria (*Phormidium laetevirens, Blennothrix lyngbyaceae* and *Anabaena* sp), one sponge (*Dysidea avara*) and four macroalgae (*Ulva* sp., *Dichotomaria marginata*, *Laurencia dendroidea* and *Laurencia elata*) - that were collected in Gramuté Beach, Aracruz, Espírito Santo, Brazil and Bahía de Jobos, Salinas, Puerto Rico and identified by metagenome shotgun and metabarcoding - were analyzed against the three tumor cell lines with the highest incidence worldwide: lung carcinoma (A549), breast cancer (MCF7) and colorectal cancer (HCT116). This analysis was performed by MTT cell viability tests to measure the IC_{50} (µl/mL) with two distinct cytotoxic standards: cisplatin (synthetic) (HCT116: IC_{50}=7.85; MCF7: IC_{50}=13.22; A549: IC_{50}=4.00) and quercetin (natural) (HCT116: IC_{50}=37.02; MCF7: IC_{50}=69.17; A549: IC_{50}=25.64) at 6 different concentrations for all samples. *Phormidium laetevirens, Blennothrix lyngbyaceae, Ulva* sp. *and Dichotomaria marginata* demonstrated cell viability close to 100% at all concentrations tested. *Anabaena* sp. demonstrated cell viability close to 90% on MCF7 and A549 cell lines, however it demonstrated IC_{50}=49.14 on HCT116 cell line. *Dysidea avara* (HCT116: IC_{50}=40.39; MCF7: IC_{50}=41.88; A549: IC_{50}=34.18), *Laurencia dendroidea* (HCT116: IC_{50}=29.21; MCF7: IC_{50}=73.17; A549: IC_{50}=41.06) and *Laurencia elata* (HCT116: IC_{50}=30.30; MCF7: IC_{50}=60.97; A549: IC_{50}=33.24) demonstrated low cell viability in all tumor cell lines tested at a concentration of 100µl/mL, with *D. avara* being the sample with the highest cytotoxic potential when compared to the standards tested. Sponges and red algae have solid evidence of cytotoxic metabolic profile in literature, being a strategic and promising source, whose explored potential contributes to the development of new anticancer therapies.

Keywords: *Cancer, marine organisms, secondary metabolites, cytotoxicity, anticancer therapies.*