

The cytotoxic and cytostatic effect of extracts from *Aphanothece halophytica* in cancer cells

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The recent estimated incidence was 600,000 new cases of cancer each year in Brazil. Cyanobacterias are photoautotrophic prokaryote organisms, which are recognized as producers of secondary metabolites with unique structural characteristics, presenting antibacterial and anti-inflammatory effects. The aim of this study is to evaluate the anticancer effect of the *Aphanothece halophytica*'s extracts (*A.halophytica*) in different human cancer cells.

The cyanobacteria extrates were collected in a specific hypersaline microenvironment during the 2019's spring. The material was extracted in 1:1 Ethyl Acetate:MeOH for 2h. After reconstitution in dimethyl sulfoxide, increasing concentrations were used in MTT assay with cancer cell lines, T98G (glioblastoma), MDA (breast), A549(lung), K562 (leukemia) and a healthy human fibroblast for 72h. The cytostatic effect was analyzed by flow cytometry as well as DNA fragmentation. For chemical basic profile the thin layer chromatography was performed, using Hex: CH₂Cl₂ 1.5:8.5 and AcOEt 100% elutions and revealed by Dragendorff, KMnO₄, FeCl₃, EtOH 5% H₂SO₄ and Ninhydrin.

It was observed a variation in the cyanobacteria species between the 3 collections, being mostly composed by *A. halophytica* (extract 2) and presenting 10% and 15% of *A. clathrata* in extracts 1 and 3, respectively. The extract 1 showed a significant cytotoxic effect in MDA (IC₅₀=690.8µg/mL) and A549 (IC₅₀=1,827µg/mL) cells. The cytotoxic effect of extract 2 was only saw in the MDA (IC₅₀ = 597.9g/mL) cells and T98G, MDA and K562 cells presented significant S and G2/M arrest. The extract 3 didn't have cytotoxic effect. Extracts 1 and 3 demonstrated significant S and G2/M arrest only in T98G and MDA cells. The chemical analysis exhibited different classes of secondary metabolites between collections. All extracts didn't have effect in healthy cells. We suggest that cyanobacteria's extract present bioactive compounds as source of marine biopharmaceutials in the future.