

Antitumoral effects of Hibiscus Sabdariffa on human breast cancer cells

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Hibiscus Sabdariffa (HS) is a plant commonly used in folk medicine (1). In recent years HS has gained great interest due to its important antioxidant, anti-inflammatory and antitumoral properties. In our work, we evaluated the *in vitro* anticancer effects of HS extract against two different human breast cancer cell lines: estrogen receptor (ER) positive MCF-7 cells and ER negative MDA-MB-231 cells. We tested both total extract (HSE) and one fraction obtained by ethyl acetate extraction (HSEC). MTT assay and Trypan Blue vital count showed a dose and time dependent reduction of the viability in both cell lines treated with different concentrations of HSE or HSEC compared to untreated control cells. A significantly marked reduction was observed in MCF-7 cells treated with HSEC. On the basis of our results we used the concentrations of 7.5mg/ml and 3.5mg/ml respectively for HSE and HSEC. In order to evaluate ER involvement in HS effect, we analyzed the cellular localization of the receptor (ER α isotype) by immunofluorescence experiments. Untreated MDA-MB-231 cells showed a low expression of the receptor mostly localized at the cytoplasmic level and treatment with HSE or HSEC didn't change this state. Untreated MCF-7 cells showed a greater expression of the receptor, with nuclear and cytoplasmic localization. Following HSE or HSEC treatment ER α localization became more cytoplasmic and this effect was more evident after HSEC induction. These data were also confirmed by ER α western blot analysis. Subsequently, we studied HSE and HSEC ability to alter migration and invasion capacity of ER positive MCF-7 cells. Using a scratch wound healing assay we did not observe any change in the migration of cells compared to untreated cells. On the contrary, in a Boyden chamber invasion assay, HSE, and especially HSEC, induced reduction of MCF-7 cell invasion. In conclusion, we have demonstrated that HS is able to reduce cell viability of ER positive MCF-7 and ER negative MDA-MB-231 cells. This effect is more evident in MCF-7 cells in which ER localization and reduced cell invasion were observed. These results are more evident after HSEC treatment. Further studies will be needed to better elucidate the involved mechanisms of action.

References

- [1] Ali et al. (2005) Phytochemical, pharmacological and toxicological aspects of Hibiscus sabdariffa L.: A review. *Phytother Res* 19, DOI: 10.1002/ptr.1628.

Keywords

Hibiscus sabdariffa; human breast cancer cells.