

Antioxidant and anti-proliferative activities of Roselle juice on Caov-3, MCF-7, MDA-MB-231 and HeLa cancer cell lines.

ABSTRACT

Roselle (*Hibiscus sabdariffa* Linn) extract has been scientifically proven to possess high antioxidant activity, anti-proliferation and anti-carcinogenic properties. This study was conducted to evaluate the antioxidative capacity of commercialized Roselle juice (RJ) at three storage periods and its anti-proliferative effect on breast (MCF-7 and MDA-MB-231), ovarian (Caov-3) and cervical (HeLa) cancer cell lines. The antioxidant activity of 1 week (WRJ), 1 month (MRJ) and 1 year (YRJ) juice samples each at 0.001 to 10% concentration range were determined through 1-diphenyl-2-picrylhydrazyl (DPPH) radical scavenging assay with L-ascorbic acid as positive control. EC₅₀ values of WRJ, MRJ, and YRJ were found to be 3.733 ± 0.247 , 3.717 ± 0.637 and $3.383 \pm 0.711\%$, respectively. These values were compared to $0.217 \pm 0.616\%$ for positive control. The difference in antioxidant activity between different storage periods of RJ was not significant ($p > 0.05$) but all samples exhibited increasing activity with increasing concentrations. RJ at the same concentrations were tested using the MTT (3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyl tetrazolium bromide) assay on the four cell lines to obtain the percentage viability of the cells. The cells were incubated for 72 h after inoculation with RJ and the control group was without treatment. The IC₅₀ was found to be highest for Caov-3 cells ($2.267 \pm 1.193\%$) whereas MCF-7 cells exhibited the lowest ($0.432 \pm 0.278\%$) IC₅₀ value after treatment with MRJ. All determinations were analyzed using ANOVA through SPSS with $p < 0.05$ considered as significant. Increasing concentrations of sample corresponded to lower percentage viability of cells for all samples, however the interaction within and between cell type and storage period was not significant ($p > 0.05$). The study showed that commercialized Roselle juice has strong antioxidant capacity and anti-proliferative activity on the four cancer cell lines despite different storage periods. However, further study should be conducted to establish its anti-cancer mechanisms.

Keyword: *Hibiscus sabdariffa*; Antioxidant activity; Anti-proliferation properties; Anti-carcinogenic properties; Breast cancer cell line; Cervical cancer cell line; Ovarian cancer cell line.