

Antitumoral effects of *Hibiscus sabdarifa* on human oral squamous cell carcinoma and multiple myeloma cells

Mariarosaria Miloso, Daniele Maggioni, Alessio Malacrida, Dana Foudah, Cristina Caldara, Giovanni Tredici and Gabriella Nicolini

Dept of Surgery and Interdisciplinary Medicine, University of Milan-Bicocca

Epidemiological data consistently demonstrate a reduced cancer risk associated with a polyphenols rich diet. *Hibiscus sabdarifa* (HS), a polyphenols rich plant widely consumed worldwide as beverage and used in folk medicine, has recently gained interest thanks to its antioxidant, anti-inflammatory and chemopreventive properties.

In the present study we investigated the antitumoral potential of HS extract in two different human tumor cell lines: Multiple Myeloma cells (RPMI 8226) and Oral Squamous Cell Carcinoma cells (SCC-25).

MTT assays showed that HS extract induced a dose-dependent viability reduction in both the cells lines. For the subsequent experiments we used HS at the concentration of 5 mg/ml that was the most effective in inducing cell viability reduction after 48h of treatment.

Viable cell count using trypan blue staining demonstrated that the HS extract induced decrease in cell growth of both the cell lines and this was due to a reversible cytostatic rather than a cytotoxic effect.

Wound-healing and cell invasion assays, respectively performed by a scratch of cell monolayer and Boyden Chamber transwell test, demonstrated that HS extract was able to reduce motility and invasiveness in both RPMI 8226 and SCC-25 cells.

The chemical inhibition of ERK1/ERK2 and PI3K, with U0126 and wortmannin respectively, reduces proliferation and migration of both SSC-25 and RPMI cells and HS extract treatment played an additive action with the inhibitors.

In conclusion, our results suggest that HS extract have antitumoral properties, since it proved to inhibit tumoral cell growth and cell migration and invasiveness. It is interesting to note that HS extract is effective against two very different tumor cell lines. In fact, RPMI 8226 cells are of hematopoietic origin and grow in suspension, whereas SCC-25 cells derive from epithelium and are characterized by adherent cell growth. Therefore, although further studies are needed to clarify the molecular mechanisms involved in its action, we proposed HS as a potential chemopreventive agent.

Key words

Hibiscus sabdarifa, human multiple myeloma cells, human oral squamous cell carcinoma cells, ERKs, PI3-K.