Cell proliferative and radioprotective properties of bioactive *Salvia sclareoides* extracts

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Salvia species (some of them commonly referred to as sage) are well known in folk medicine throughout the world. Since ancient times, plants belonging to the Labiatae family have been used for treating various diseases, including cancer. *Salvia sclareoides* is an endemic Portuguese plant.

Four extracts of *Salvia sclareoides* (whole plant) were evaluated - methanol, buthanol, water and ethanol extracts - for cytotoxic activities against a human leukemia cell line (K562) irradiated with a low dose of γ rays. As a control, a non irradiated K562 cell culture was used.

Both radioprotection and radiosensitizing are important and useful mechanisms with potencial application as co-adjuvants in radiotherapy treatments, either to protect the normal cells from the side effects of radiation, or to trigger an increased response (for example by inducing apoptosis in cancer cells).

To investigate the toxicity and radiation response modulation profiles of the Salvia plant extracts, K562 cells were irradiated with 50 mGy of γ ray (Co-60, 150 mGy/min), followed by an incubation period of 1 hour and exposure to the test compounds at the final concentration of 2,25 mg/ml. The 3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyltetrazolium bromide (MTT) assay was performed to quantify metabolically viable cells in all samples.

The buthanol and methanol extracts of *Salvia sclareoides* displayed the most striking effect regarding cell proliferation and radioprotective activity. K562 cells exposed to the mentioned extracts had a significant 2-fold increase in their viability in both the simple extract exposure and the combined extract/irradiation.

Salvia sclareoides ethanol extracts showed a lower but also significant radioprotective activity. The water extract of *Salvia sclareoides* displayed the lowest radioprotective profile.

The results of the in vitro toxicity and radioprotective activity show that there may be a potential application of *Salvia sclareoides* extracts in human health.