

High antioxidant Australian plant extracts: anti-proliferative activities against CaCo2 and HeLa cell lines

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Introduction. High levels of antioxidant phytochemicals have been linked to the treatment and prevention of several cancers. Recent reports have identified a number of native Australian fruits as having high antioxidant capacities. Despite this, several of these species are yet to be tested for anticancer activity.

Methods. Solvent extracts were prepared from high antioxidant native Australian plants and their antioxidant capacities were determined by the DPPH free radical scavenging assay. Anti-proliferative activities against CaCo2 and HeLa cancer cells were determined by an MTS based cell proliferation assay. Toxicity was determined using the *Artemia franciscana* nauplii bioassay.

Results. The methanolic and aqueous extracts of all plant species displayed high antioxidant contents (equivalent to 16-95 mg of vitamin C per gram of plant material extracted). In contrast, the ethyl acetate extracts for all species had relatively low antioxidant contents (generally below 5 mg of vitamin C equivalents per gram of plant material extracted). The antioxidant contents correlated with the ability of the extracts to inhibit proliferation of CaCo2 and HeLa cancer cell lines. The high antioxidant methanolic and aqueous extracts of all species were potent inhibitors of cell proliferation, with IC50 values generally below 1000 µg/mL. The aqueous *S. australe* fruit extracts were particularly effective, with IC50 values of 27 and 172 µg/mL against CaCo2 and HeLa cells respectively. In contrast, the lower antioxidant content ethyl acetate extracts generally did not inhibit cancer cell proliferation. Indeed, exposure of the cancer cells to most of the ethyl acetate extracts induced potent cell proliferation. The methanolic and aqueous *Syzygium* extracts displayed significant toxicity in the *Artemia franciscana* bioassay, with LC50 values below 1000 µg/mL. All other extracts were nontoxic.

Discussion. The antiproliferative activity of the high antioxidant plant extracts against HeLa and CaCo2 cancer cell lines indicates their potential in the treatment and prevention of some cancers.