Cytotoxicity of Mamaki (Pipturus albidus) on LNCaP Cells

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Prostate cancer is the second leading cause of death for American men. Sadly, Native Hawaiian men have the highest mortality rate from the disease. Mamaki, an endemic Hawaiian plant and a vital part of Hawai?i's ecosystem, has long been valued for its medicinal properties. The purpose of this research was to see if mamaki, like certain members of the nettle family, inhibits prostate cancer. No prior information was found via a literature search on this topic. Crude red-veined mamaki leaf, fruit, and woody stem extracts were made and diluted to concentrations of 1, 10, and 100 mg/mL. These extracts were tested on LNCaP cells, which were cultured by the student researcher, and cytotoxicity was measured using Cyquant XTT Cell Viability Assays. It was determined that the 10 and 100 mg/mL concentrations significantly decreased LNCaP cell viability, with the 10 mg/mL concentration being most optimal out of those that were tested and the woody stem extract being the most effective ($p<0.001$). A later experiment tested 5-month-old and fresh extracts. It was determined that the extracts remained stable over time ($p<0.001$). Also, the mamaki extracts selectively inhibited the growth of the LNCaP cells, at least when compared to HeLa and HEK293 cells ($p<0.001$). Last, a qualitative phytochemical screening revealed that all extracts contained varying amounts of phenolic compounds, flavonoids, tannins, and alkaloids, but only the woody stem extract had cardiac glycosides. The results of this study, if explored further, may unveil whether or not mamaki has a place in prostate cancer treatment.

Awards Won:
Fourth Award of $500