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Selective Action of Aqueous Maté Extract on Human Breast Cancer

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Ilex paraguariensis, Yerba Maté, is a subtropical plant native to South America, where it is consumed several times daily as a tea made with roasted leaves. Several studies have been conducted to elucidate the beneficial effects of this plant. A recent study has shown that saponins isolated from Yerba Maté extract induce apoptosis in human colon cancer cells, while another study indicated that the consumption of Maté tea causes higher incidence of esophageal cancer. Our study looked into the effects Yerba Maté extract have on human breast cancer cells and non-cancer cells from the same tissue. The findings show a decrease in viable T47D breast cancer cells after treatment with crude Maté extract in a dose-dependent manner, whereas the normal cells, MCF12A, seem to be equally affected by Maté extract and PBS/water. To elucidate the mechanism by which Maté extract causes breast cancer cells to die, and how the non-cancerous cells die regardless of the media content, we quantified different markers of apoptosis. With the use of flow cytometry, caspase 3-AF 647 and p53 FITC assays allowed us to detect an increase in both caspase 3 and p53 concentrations. These findings suggest that the treatment with Yerba Maté extract results in an upregulation of pro-apoptotic markers in breast cancer cells, thereby decreasing their viability through apoptosis, which is a programmed cell death mechanism, whereas the non-cancerous cells do not respond to Maté treatment in any particular manner. Consequently, Maté extract seems to kill cancerous cells in a selective manner.