

In vitro evaluation of the cytotoxic, anti-proliferative and anti-oxidant properties of pterostilbene isolated from *Pterocarpus marsupium*.

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Abstract

Pterostilbene, a dimethyl ester derivative of resveratrol, may act as a cytotoxic and hence as an anti-cancer agent. The present study was conducted to test the anti-cancer activity of pterostilbene purified from *Pterocarpus marsupium* on breast (MCF-7) and prostate (PC3) cancer cell lines. The purified pterostilbene was found to cause apoptosis in both the cell lines, which was marked by DNA fragmentation, formation of apoptotic bodies and membrane distortions. Apoptosis probably was due to the production of reactive oxygen species in MCF-7 and nitric oxide over production in PC3 cells. Even the drug detoxifying anti-oxidant enzymes could not nullify the effect of pterostilbene as required by the cancer cells for survival. Pterostilbene was found to inhibit the cell proliferating factors like Akt, Bcl-2 and induced the mitochondrial apoptotic signals like Bax, and the series of caspases. It also inhibited Matrix metalloproteinase 9 (MMP9) and alpha-methylacyl-CoA reductase (AMACR), two very well known metastasis inducers. In conclusion, pterostilbene has multiple target sites to induce apoptosis. Hence, after proper validation it can be used as a potential agent for the cure of breast and prostate cancer.