



***In-vitro* Study of Cytotoxic Effect of *Cinnamomum zeylanicum* Leaves and Bark Extracts Against Breast Cancer Cell Line; MCF-7**

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ABSTRACT

Cinnamomum zeylanicum Blume (Ceylon cinnamon; belongs to the family Lauraceae) is a popular spice used worldwide and claimed for various pharmacological applications including anti-oxidant, anti-microbial and anti-cancer activities. Several studies have shown strong cytotoxic potential of cinnamon bark extracts against different cancer cells. Further, it is reported that anti-carcinogenic potential of cinnamon varies with the types of cancers and the nature of the extracts. Though leaves of Cinnamon contain numerous bioactive compounds, its anti-cancer activities against different cancers have been less studied. Therefore, this study was carried out on comparatively investigation of cytotoxic effects of leaves and bark of Ceylon cinnamon against human breast cancer cells. The extracts were prepared using leaves and bark of cinnamon in five -year maturity stage via macerating with water and methanol. The cytotoxic effect of methanolic and aqueous extracts against human triple positive adenocarcinoma (MCF-7) cell line were evaluated at a post-incubation of 48 hrs using MTT colorimetric assay. Cell viability of MCF-7 was evaluated by mitochondrial dehydrogenases activity at concentrations of 25, 50, 100, 200 $\mu\text{g mL}^{-1}$ of leaves and bark extracts compared to the negative and positive control, 0.5% methanol and Tamoxifen respectively. A moderate cytotoxic effect was observed in both (leaves and bark) methanolic extracts while no cytotoxic activity was evident by aqueous extracts against MCF-7. Out of the two methanolic extracts, bark showed higher cytotoxic effect (IC_{50} ; 59.43 $\mu\text{g mL}^{-1}$) compared to leaves (IC_{50} ; 127.65 $\mu\text{g mL}^{-1}$). However, the cytotoxic effects of leaves and bark are not as stronger as that of tamoxifen (IC_{50} ; 9.86 g mL^{-1}). The findings of this study confirmed that the leaves have less cytotoxic potential towards MCF-7 compared to the bark. As an outcome, it is suggested of developing nutraceutical supplements using leaves and bark of Ceylon cinnamon to be used in reducing the risk of cancer.

Acknowledgement: NSF grant SP/CIN/04/2016 and University of Ruhuna

Keywords: Cancer, Ceylon cinnamon, methanolic extracts, aqueous extracts, MTT assay