Anticancer Effect And Apoptosis Induction Of Dracaena Cinnabari Balf.F On H400 Human Oral Squamous Cell Carcinoma (OSCC)

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Abstract

Oral squamous cell carcinoma (OSCC) is the sixth most common malignancy worldwide and the 5-year survival rate of around 50% has not improved significantly during the past 30 years. New approaches to treat the disease are urgently needed. Chemotherapy with anticancer agents derived from natural products offer a promising new approach in an attempt to improve patient prognosis. Dracaena cinnabari, is a deep red resin that possesses various pharmacological properties, but its anticancer properties have not been elucidated. This study to determine the cytotoxic and apoptosis-inducing effects of D. cinnabari on OSCC cells. The cytotoxicity of D. cinnabari crude extract was examined using six OSCC cell lines. D. cinnabari crude extract exhibited the greatest cytotoxicity activity on H400 cells with an IC50 of 5.9 μg/mL and it was selected as targeted cell line for further experiments. On the other hand, D. cinnabari crude extract showed selectivity towards OSCC cells, compared to normal human oral fibroblasts. D. cinnabari was able to inhibit the proliferation of H400 cell and this was achieved primarily via apoptosis, where externalization of phospholipid phosphatidylserine and chromatin condensation were observed using DAPI/Annexin-V fluorescence double staining. Mechanistic studied through mitochondrial membrane potential (MMP) Assay, cytochrome c enzyme-linked immunosorbent assay, caspases Assay and apoptotic proteins array revealed depolarization of MMP, leading to the translocation of SMAC and cytochrome c into cytosol and subsequent activation of initiator caspase 9 and executioner caspase 3/7. Cell cycle analysis by flow cytometry demonstrated an increase in H400 cells in the S phase upon treatment with D. cinnabari. Therefore D. cinnabari induced apoptosis in OSCC via activation of the intrinsic pathway and is associated with the depolarization of MMP, caspase 9 activation, as well as released of cytochrome c. The results of this study indicate that specific extracts of D. cinnabari have promise to be developed as novel therapeutic agents for the treatment of OSCC.