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Chemoprevention Effects Through Polyamines Modulation Induced by Clinacanthus nutans in Human Lung Adenocarcinoma Cells (A549)

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Abstract

Introduction: Polyamines involves in cellular proliferation, maintenance and transformation which was discovered to be dysregulated in many types of carcinogenesis by which high intracellular bioavailability represent the promotion of tumour growth, invasion and metastasis. While high polyamines types of foods suggested to be portion-controlled in cancer patients, traditional herbal plants have also been investigated for its efficacies in controlling polyamine synthesis thus making it to be suitable chemoprevention agents targeting to mitigate the risk of cancer occurrence and recurrence. This study aimed to determine the cytotoxicity effect and modulation of polyamine synthesis induced by Sabah Snake Grass (*Clinacanthus nutans*) on human lung adenocarcinoma cells, A549. Methods: The antiproliferative effect of *C. nutans* was investigated using trypan blue exclusion assay. The intracellular polyamines content was quantified using High Performance Liquid Chromatography (HPLC) while gene expression analysis was done using quantitative PCR. Results: The IC50 values for *C. nutans* was 20 µg/ml and it has been demonstrated that *C. nutans* hamper the A549 cell's growth after 24 hours of exposure. Depletion of polyamines level after 24 hours to 96 hours of exposure were observed and aligned with a significant gene expression changes of spermidine/spermine-N1-acetyltransferase (SSAT), antizyme (AZ1) and ornithine decarboxylase (ODC) activities. Conclusion: *C. nutans* has a potential as chemopreventive agents since they demonstrated to reduce cell proliferation and decrease polyamines intracellularly. The reduction of polyamines reflects by increase catabolic enzymes, SSAT and decreasing activity in biosynthesis pathway which involves AZ1 and ODC. Further investigation is warranted to evaluate the mechanism and pathway of cell death and the impact of *C. nutans* on normal cells. © 2023 UPM Press. All rights reserved.

Author Keywords

Antizyme; *Clinacanthus nutans*; Ornithine decarboxylase; Polyamines; Spermidine/spermine N-1 acetyltransferase

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