



TITLE: HPLC Isolate from the Leaves of Kaffir Lime (*Citrus hystrix* DC) Exhibits Selective Cytotoxicity Against Human Breast Adenocarcinoma Cell Line, MCF-7

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ABSTRACT

The increasing mortality and morbidity rate caused by breast cancer warrants the need to screen for compounds ideal for chemotherapeutic application. This study evaluated the anticancer activity of an edible and native plant, *Citrus hystrix*, utilizing a bioactivity-guided fractionation scheme. Using various chromatographic techniques, the fractions were subjected to MTT assay to determine cytotoxicity and performed bioassays to confirm apoptosis, the preferred mode of cell death. The results revealed that fractions extracted using Gravity Column Chromatography (GCC) and High-Performance Liquid Chromatography exhibited selective and anticancer activity against human breast adenocarcinoma cell line (MCF-7). The IC₅₀ value of these fractions were markedly promising- 14.6 µg/mL for GCC 7.4 and 5.5 µg/mL for HPLC 7.4.5. Interestingly, these fractions were found to have no cytotoxic effect against non-cancer cell lines- human dermal fibroblast cell line (HDFn), mouse embryonic fibroblast cell line (NIH3T3), and Chinese hamster ovarian cell line (AA8). The results further revealed that GCC 7.4 was able to induce apoptosis in breast cancer cell line, as confirmed by several markers including phosphatidylserine (PS) membrane translocation, mitochondrial membrane depolarization, nuclear condensation, and DNA fragmentation. Overall, the results strongly demonstrated that *C. hystrix* leaves possess promising compounds that are

highly selective and cytotoxic against the breast cancer cell line, MCF-7, mainly by inducing apoptosis.

BIOGRAPHY (upto 200 words)

Fatima Mariz Almenario-Gammad has completed her Master of Science in Biology at the age of 26 years old from University of the Philippines Diliman, the country's premier state university. As a young researcher, she has recently published research articles from peer-reviewed scientific journals. She is currently an assistant professor and the head of the Biology Department of Doña Remedios Trinidad Romualdez Medical Foundation, one of the recognized medical schools in the Philippines. She has been one of the board members of two (2) reputable scientific organizations in the Philippines, the Philippine Society for Developmental Biology (PSDB) and Biology Teacher's Association of the Philippines (BIOTA). She has participated and won several research presentations in both oral and poster category. Her research interests include cancer cell biology, drug discovery on plant natural products, and stem cell biology.



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