

Abstract

Background – Cancer is one of the diseases that leading to death in worldwide that can be caused by the carcinogens leading to the genetic mutations. The established cancer drugs and treatments often cause severe side effects and because of that, people try to look for alternative medications through herbs. The *Phyllanthus niruri* is one of the herbs found mostly in the tropical countries suspected has an antiproliferative effect towards the cancer.

Objective – This study aims to observe the effects of IC50 concentration of *Phyllanthus niruri* extract toward the *p53*, *Bax*, BCL-2, and *Rb* gene expressions related to the HeLa cell proliferation inhibition and apoptotic pathway in molecular level.

Methodology –The Hela cell line was cultured by using complete DMEM as the media into the T-25 flasks and then seeded into the 6-well plates. The Hela was starved in the 6-well plate by changing the complete media to DMEM only and incubated for 3 to 4 hours before treatment. After the starving period, the Hela was treated by using the IC50 concentration of the *Phyllanthus niruri* extract and incubated for 24 hours. After 24 hours, the RNA extraction, gel electrophoresis, and cDNA synthesis were done before the PCR. Last, the PCR was run for 40 cycles with specific genes, temperatures, and time.

Result and Conclusion – Both the *Bax* and *Rb* genes were upregulated, while the *p53* and BCL-2 genes were downregulated. It means, the *Phyllanthus niruri* extract has a potential effect as an antiproliferation to inhibit the cancer cells growth.

Keywords: Phyllanthus niruri, p53, Bax, bcl-2, Rb