

ABSTRACT

Among the many causes of death, cancer has ranked second as the major contributor of mortality worldwide and has caused a high rate of mortality in Indonesia alone. Chemotherapy is a common treatment used to treat cancer, yet chemotherapy is cytotoxic to both cancer cells and healthy cells, causing a lot of undesired adverse effects such as hair loss, nausea, and anemia. Recently, plant-derived natural therapies have drawn attention as an alternative to commonly used chemotherapy due to their potential to have anticancer phytochemical properties, less adverse effects, lower price, and are readily available. *Laportea decumana* has been reported to contain phytochemicals with anti-cancer properties including terpenoid, alkaloid, and triterpenoid. Therefore, this study aims to investigate *L. decumana* methanol extract anticancer activity towards the HT29 cell line and analyze possible cell death mechanisms exerted by the extract to induce a cytotoxic effect on cancer cells. The *L. decumana* extraction was done through maceration with methanol. The cytotoxicity of the extract in HT29 cells was assessed using MTT assay which shows the moderate cytotoxic effect of *L. decumana* extract on HT29 with IC50 of 48.09µg/ml. *L. decumana* extract also significantly inhibits the cell proliferation, colony formation cell migration of HT29 cells in a concentration-dependent manner. The RT-qPCR result shows inconclusive results due to contamination, but the methanol extract of *L. decumana* is shown to alter BAX and BCL-2 gene expression, which are crucial in the intrinsic mitochondrial apoptotic pathway. Optimization of the methods and further research is required, but the *L. decumana* methanol extract has the potential as an anti-cancer candidate.

Keyword: *Laportea decumana*; Anticancer; Apoptosis; Cytotoxic; HT29 cell