

Aqueous leaf extract of *Clinacanthus nutans* inhibits growth and induces apoptosis via the intrinsic and extrinsic pathways in MDA-MB-231 human breast cancer cells

ABSTRACT

Background: *Clinacanthus nutans* possesses several reported biological activities against different human cancer cells. However, reports on the growth-inhibitory effect of *C. nutans* leaf extract on the aggressive triple-negative breast cancer cells and the mechanisms of induced-cell death in these cells are limited. **Objectives:** The study aimed to assess the anticancer efficacy and associated mechanisms of the crude aqueous extract of *C. nutans* leaves (cCN) in MDA-MB-231 triple-negative human breast cancer cells. **Materials and Methods:** The metabolic viability of the MDA-MB-231 cells following respective treatments with cCN was measured using an adenosine triphosphate luminescent assay. The mode of cell death in MDA-MB-231 cells induced by cCN was examined using a luminescence- and fluorescence-based assay and the mechanisms involved were evaluated by comparative analysis of gene expression by reverse transcription–quantitative polymerase chain reaction. **Results:** Dose- and time-dependent growth inhibition of MDA-MB-231 cells by cCN was observed (IC₅₀: 191.20 µg/mL). cCN also induced apoptotic cell death in the treated cells via the intrinsic and extrinsic apoptosis pathways by affecting the mRNA expression levels of *Bad*, *Bax*, *Bcl-2*, *Bcl-xL*, and *FasL*. **Conclusion:** These results suggest that *C. nutans* can be used as a potential agent in the treatment and prevention of breast cancer.