

## **Bcl-2 was downregulated in G2/M-arrest breast cancer cells MCF-7-treated with nordamnacanthal**

### **ABSTRACT**

Nordamnacanthal, an anthraquinone extracted from the root of *Morinda elliptica* has cytotoxic properties towards various cancer cell lines and antitumor-promoting activities. This study was conducted to determine the effects of nordamnacanthal on the cell cycle, and the expression of Bcl-2 and Bax in breast cancer (MCF-7) and acute t-lymphoblastic leukemia (MOLT-4) cells at 50% of the total cell population underwent apoptosis. Nordamnacanthal caused 50% of MCF-7 and MOLT-4 cells underwent apoptosis at 15 g/ml and 70 g/ml, respectively, as analyzed by using a fluorescence microscope following staining with the acridine orange (AO) and propidium iodide (PI). The apoptotic cells exhibited nuclear fragmentation, chromatin condensation in the nucleus and membrane blebbing. Cell cycle analysis by flow cytometry indicated that nordamnacanthal arrested MCF-7 cells at the G2/M phase. For MOLT-4, no cell cycle arrest was observed. Bcl-2 and Bax were downregulated in nordamnacanthal-treated MCF-7 cells. On the other hand, expression of the proteins in MOLT-4 was not significantly different ( $p>0.05$ ) from the control. In conclusion, treatment of MCF-7 cells with nordamnacanthal at the concentration that caused 50% of the total cell population underwent apoptosis, induced the G2/M arrest with downregulation of Bcl-2.

**Keyword:** Nordamnacanthal; Apoptosis; Cell cycle arrest; Bcl-2 family proteins