CYTOTOXIC EFFECT OF MADAGASCAR PERIWINKLE (*Catharanthus roseus* (L.) G. Don) ETHANOLIC LEAVES EXTRACT IN BREAST CANCER MCF-7 CELL LINE

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ABSTRACT

Cancer is a genetic disease caused by inheritance aspects that perform a crucial part in cell growth, leading to unusual cell proliferation. WHO in 2020 stated that in Indonesia there were 396,914 cancer cases and 65,858 were people with breast cancer which occupied as much as 16.6% of all cancer cases in Indonesia. The data indicates that there is a need for the development of new treatments since chemotherapy is being phased out due to its negative effects. Indonesia is a tropical country with a diverse range of medicinal plants that can be used to cure cancer, such as Madagascar periwinkle (*Catharanthus roseus* (L.) G. Don). The vinca alkaloids containing vinblastine and vincristine from *Catharanthus roseus* have been used to treat several cancer types. Therefore, this research was conducted to find out the cytotoxic effect and metastasis inhibition of several doses of Madagascar periwinkle ethanolic leaves extract against breast cancer MCF-7 cells. The extraction of Madagascar periwinkle was carried out using 70% ethanol with Soxhlet method, the anti-cancer active compounds detection was carried out with thin-layer chromatography (TLC) method, the cytotoxic test of Madagascar periwinkle leaves extract against breast cancer MCF-7 cells was carried out with MTT assay, and the apoptosis test of Madagascar periwinkle leaves extract against breast cancer MCF-7 cells was carried out using flow cytometry, and data analysis of the cytotoxic test and apoptosis test was carried out. The results showed that the optimal IC50 value of Madagascar periwinkle leaves extract against breast cancer MCF-7 cells was 586 µg/mL, and the majority of metastasis inhibition of MCF-7 cells was due to necrosis, as much as 83.1% in 1 IC50 and 84.4% in 1/2 IC50.

Keywords: *Catharanthus roseus*, Madagascar periwinkle, breast cancer, MCF-7, MTT assay