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EVALUATION OF THE CYTOTOXIC ACTIVITY OF TAGITININ C IN BREAST CANCER CELLS

Fernanda Brito Leite[1*], Wanderleya Toledo dos Santos[1], Albert Katcborian Netto[2], Daniela Chagas de Paula[2], Ana Cláudia Chagas de Paula Ladvocat[1].

fernandabrito.leite@estudante.ufjf.br

1-Department of Pharmaceutical Sciences, Federal University of Juiz de Fora, 36036-900, Juiz de Fora, Minas Gerais, Brazil. 2-Chemistry Institute. Federal University of Alfenas, 37130-001, Alfenas, Minas Gerais, Brazil.

Breast cancer is the second most common cancer in women and the second leading cause of cancer-related death among them. It has been the focus of scientific studies worldwide with the clear objective of reducing its incidence and improving its treatment. Given the severity of the disease and the significant adverse effects associated with current therapies, it is urgent and essential to invest in research aimed at developing new treatments. Based on this scenario, the aim of the present study was to investigate the cytotoxic activity of the sesquiterpene lactone Tagitinin C (TC), a compound isolated from *Tithonia diversifolia*, in a breast cancer cells *in vitro*. TC has been described as having antimicrobial, antifibrotic, and cytotoxic properties against some human cancer cell lines. In this study, its cytotoxic activity was widely evaluated for the first time against breast cancer cells (MCF-7) and human fibroblasts (CCD-1059Sk). Cytotoxicity was assessed using the MTT reagent (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide), and the IC50 (the concentration required to inhibit 50% of cell viability) was calculated. From the results obtained, it was also possible to determine the selectivity index for cancer cells, the antiproliferative effect of TC, the inhibition of colony-forming capacity, and the reduction of the invasive potential of tumor cells treated with TC. Additionally, the type of cell death and the expression of apoptotic markers were evaluated using the RT-PCR technique. Thus, the results demonstrate the cytotoxic potential of TC, contributing to the discovery and development of new treatments that may be more effective, selective, and with fewer adverse effects for patients. The authors thank their institutions for their support and the financial support provided by FAPEMIG, CAPES, and CNPq.

Keywords: *Breast cancer; Tithonia diversifolia; Tagitinin C, MCF-7, cytotoxicity, apoptosis.*