"تقييم الفعالية المضادة للسرطان والمحفزة لجهاز المناعة لإزهار نبات الدفلى "Nerium Oleander""

"Evaluation of the Anticancer and Immunomodulatory Activities of Nerium Oleander Flowers"

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Abstract

This study was conducted to evaluate the immunomodulatory and anticancer properties of *Nerium oleander* flower of different solvent extracts. The antiproliferative activities of *Nerium oleander* flower was tested against different cancer cell lines (MCF-7, T47D, HCT-116, MDA- MB231, HELA, Vero) using MTT assay. Degree of apoptosis induction of the most potent antiproliferative extract was detected by using caspase-3 activity kit. ELISA was used to measure vascular endothelial growth factor (VEGF) expression in tumor cells and to measure levels of IFN- γ, IL-4, IL-2 and IL-10 secreted by splenocytes after extracts treatment. The total phenolic content was determined quantitatively using the*Folin- Ciocalteu* reagent. The *ABTS* assay was used to identify the antioxidant activity of all extracts. Macrophage function was evaluated using nitro blue tetrazolium assayand pinocytosis function was evaluated using neutral red method. The growth of cancer cell lines (T47D, MCF-7, HCT-116, MDA-MB231 and HELA) cell lines were inhibited by *Nerium oleander* Flower aqueous methanol extract, flower dichloromethane extract and flower ethyl acetate extract.

Dichloromethane extract and aqueous methanol extract increased apoptotic rate, and decreased VEGF expression. An increase in TH_1 cytokines (IFN- γ, IL-2) level and decrease in TH_2 cytokine (IL-4) level were evident after lymphocytes stimulation by flower Dichloromethane extract and flower ethyl acetate extracts. The flower aqueous methanol extract showed a significant radical scavenging activity in an $ABTS^+$-based assay. Flower ethyl acetate extract showed a significant level of total phenolfollowed by flower aqueous methanol extract.

Flower aqueous methanol extract was also the most active extract to stimulate phagocytosis followed by flower ethyl acetate extract then flower dichloromethane extract. Flower Dichloromethane extract was also the mostactive extract to stimulate pinocytosis followed by flower aqueous methanolextract.

In conclusion, the flower dichloromethane extract and flower aqueousmethanol extract showed good results and considered as a potential source for anticancer agents. The anticancer activity of those extracts is mediated by proliferation inhibition, apoptosis induction, and inhibition of angiogenesis. The immunomodulatory effect of these extracts involves activation of innate and acquired immune system.