

In vitro and vivo Studies for Assessing the Anti-Proliferative, Anti-Migration and Apoptotic Activity of *A. squamosa* L. Leaves Extract

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Abstract : Background and objectives: The most common cause of death in women worldwide is breast cancer. Regarding all chemotherapy disadvantages and side effects, it's becoming necessary to identify natural products that target cancer cells with lesser harmful side effects on non-targeted cells and biological environment. Different parts of *A. squamosa* L., commonly known as custard apple, show varied therapeutic effects. The objective of this study is to investigate in vitro and in vivo, the anti-cancer activity of *A. squamosa* leaves extract. Methods: The physiological responses using MTT, nucleus staining, and LDH assays were used to evaluate cell survival and proliferation in both ER+ and ER- cells when they were exposed to extract. Monolayer wound repair assay was used to investigate the effect of extracts on cell migration. Apoptotic gene's expression was investigated by real-time polymerase chain reaction. To study the effect of the extract on the size of tumor, breast cancer induced rats were used. Results: *A. squamosa* leaves extract showed high anti-proliferative and cytotoxicity effects against different breast cancer cell lines with high concentration, 100 ug/ml. The extracts have reduced the cells wound closure. Polymerase chain reaction revealed downregulation of Bcl-2 and upregulation of Bax. In breast cancer model animal developed in our laboratory, after 4 weeks treatment, treated groups have shown smaller tumor size in comparison with control group (n=4). Conclusion: These results suggest that *A. squamosa* leaves extract has anti-cancer activity against breast cancer in both in vitro and in vivo, and it may be developed as a potential novel agent to treat breast cancer.

Keywords : apoptosis, breast cancer, migration, proliferation

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