Scientific Journal of Impact Factor (SJIF): 4.72

e-ISSN (O): 2348-4470
p-ISSN (P): 2348-6406

International Journal of Advance Engineering and Research Development

Volume 4, Issue 11, November -2017

CYTOTOXIC POTENTIAL OF *ACALYPHA INDICA* AGAINST BREAST CANCER CELL LINES

[1]Boodida Chandragiri, [2]K.Mallaiah, [3]Ch.Saahithi

University College of Technology, OU

Abstract- *Acalyphaindica has been used since ages for treating various ailments. Our earlier studies on the phytochemical constituents of acalyphaindica has shown that it is rich in flavanoids and phenols which provide the antioxidant potential to the plant. In this regard in the present study we have tested the anti-inflammatory and cytotoxicity activity of the plant leaf extract against the breast cancer cell line MFC-72. The results have shown that the plants leaf extracts had a good cytotoxic potential and further compound isolation studies would help in therauepetic leads identification.*

Key words- *acalyphaindica, breast cancer, cytotoxicity, anti-inflammatory activity, polyphenols.*

I. INTRODUCTION

Medicinal plants have been used by mankind since ages. These plants are known to produce chemical substances called phytocompounds which provide protection to plants against herbivores and insects. These have been used to treat various ailments and diseases since ages. Among them cancer is one of the most treated disease in recent years and there has been a continuous search for antitumor agents. Among the different forms of cancer, breast cancer has been one of the most common forms seen in woman. 1 in 28 is found to be effected by breast cancer in India.In India, the number of new breast cancer cases is about 115,000 per year and this is expected to rise to 2,50,000 new cases per year by 2015. Breast cancer is usually treated with surgery and then possibly with chemotherapy or radiation, or both. But the search for potential drug therapeutics for breast cancer is need of the hour as the present available treatments have adverse reactions on body's immune system and many times even after chemo or radio therapy , the cancer cells are found to be reverted back [9,10].Under such conditions, use of plant based extracts with high medicinal value would help in reducing the side effects along with providing effective alternative therapy to the patient.In this light based on our earlier study on the phytochemical compositions and antioxidant activities of acalyphaindica, the present study validates the cytotoxic and anti-inflammatory activity of hexane extracts of acalyphaindica by MTT analysis on MFC-7 breast cancer cell lines[1,2,3].

II. MATERIALS AND METHODS

The plant material was collected and leaves were shade dried, made into fine powder. 250 ml of solvent was added to about 10 gms of dried powder for performing soxhlet extraction. The different solvents used for extraction were methanol, ethyl acetate, petroleum ether and hexane. The extraction was carried out for 48 hrs.
The extract obtained has been rotary evaporated and stored for further studies.

2.1. Anti-inflammatory activity estimation

The anti-inflammatory activity was estimated using a quantitative method. Here, 10 test tubes were taken and 5ml of 0.2 % BSA was added to each. To all the test tubes, 2.5ml of 0.2M phosphate buffer (pH 6.6) was added. Then 10 Eppendorf tubes were taken and volumes of 10µl, 20µl to 100µl of plant extract was added to tubes individually and volume was made up to 1ml by adding respective solvent. This makes a total 1ml of plant extract. This 1ml of plant extract was added to all the test tubes. Then the tubes ere heated in water bath for 10-15 minutes at 100^{O}C. O.D. values were taken at 660nm wavelength. [4,5,6].

2.2. Cytotoxicity estimation using MTT Assay on MFC-7 Breast Cancer Cell Lines

The cytotoxicity was estimated for the different solvent extracts using MFC-7 Breast Cancer cell lines in triplicates. [6,7,8].

III. RESULTS AND DISCUSSION

3.1. Anti-inflammatory activity

The following table explains the varied anti-inflammatory activity of the different solvent extracts.

Table 1. Anti-inflammatory activity of different solvent extracts

3.2. MTT Assay

Concentration	**Mean Values of Methanolic extract**	**Mean Values of Ethyl acetate extract**	**Mean Values of Petroleum ether extract**	**Mean Values of Hexane extract**
10µl	0.045	0.035	0.033	0.011
20µl	0.076	0.052	0.038	0.042
30µl	0.098	0.072	0.042	0.045
40µl	0.155	0.122	0.043	0.055
50µl	0.225	0.185	0.055	0.062
60µl	0.280	0.230	0.078	0.099
70µl	0.355	0.285	0.089	0.135
80µl	0.380	0.322	0.0122	0.138
90µl	0.425	0.385	0 0145	0.158

Table 2. The O.D values obtained for hexane solvent extract at 570nm

Sample	10mg/ml	25mg/ml	50mg/ml	Control 1	Control 2	Control 3
O.D Value	0.358	0.304	0.293	0.457	0.468	0.472
O.D Value	0.347	0.319	0.282	0.462	0.459	0.452
O.D Value	0.338	0.299	0.279	0.447	0.443	0.461

Table 3. Average OD Values for hexane solvent extract at 570 nm

Sample	Control 1	Control 2	Control 3	10mg/ml	25mg/ml	50mg/ml
Average values	0.461	0.456	0.455	0.341	0.307	0.284

Table 4. 10% Cell Viability

Sample	Control 1	Control 2	Control 3	10mg/ml	25mg/ml	50mg/ml
% Cell Viability	100	98.91	98.69	73.96	66.59	61.60

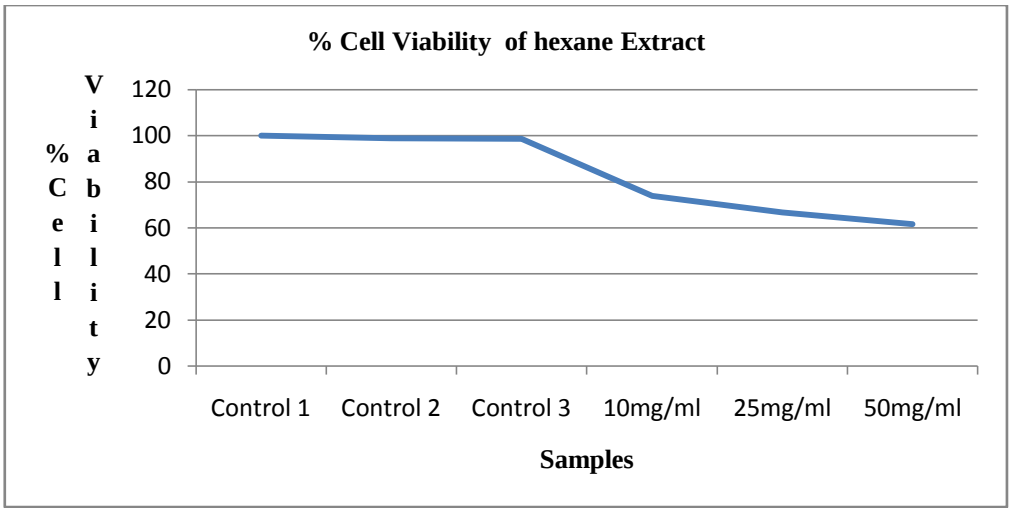

Figure 1 : Cell viability of hexane extract

Table 5. % Compound Toxicity of hexane solvent extract at 570nm

Sample	Control 1	Control 2	Control 3	10mg/ml	25mg/ml	50mg/ml
% Compound Toxicity	0	1.08	1.30	26.03	33.40	38.39

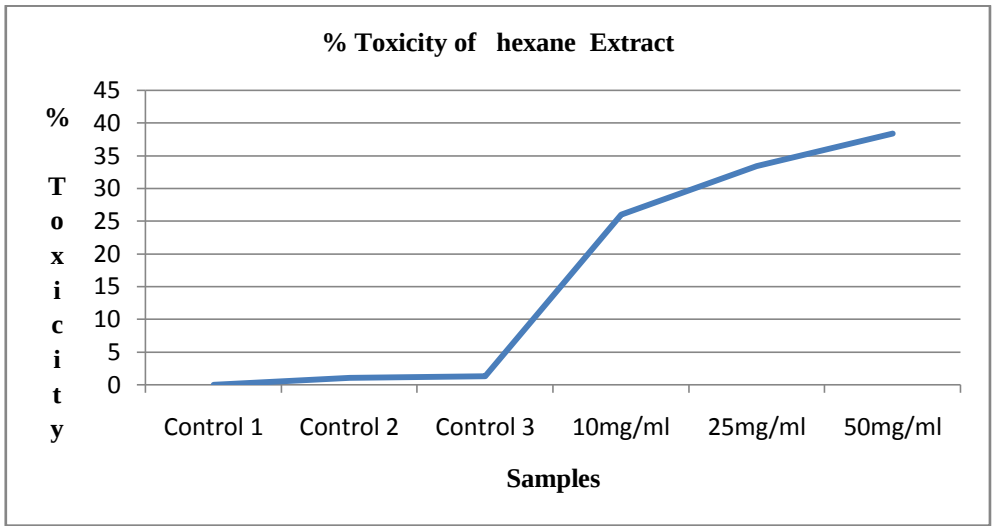

Figure 2. % Toxicity of hexane extract

MTT Assay was performed to access the cytotoxicity of *acalypha*plant extract. We can notice that as the compound concentration increases from 10mg/ml to 50mg/ml, there is a reduction in percentage of cell viability of MCF-7 cells which *indica*te that the hexane extract has potent compounds that can hinder the growth of breast cancer cells. In contrast, with reference to compound toxicity, as concentration increases, the potential of toxicity rises, showing that the plant extract is toxic to breast cancer cells.

IV. CONCLUSION

MTT assay which was performed using hexane plant extracts. The percentage toxicity values of hexane extract were increasing from point to point. This states that hexane extract has potent capacity in killing the breast cancer cells. Hence for further drug designing and isolation of active compounds for breast cancer treatment, hexane extracts can be preferred**.**Further compound isolation studies would help in identification of novel therapeutics for breast cancer. Even further synthetic biology approach might be useful for large scale production of these identified compounds.

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