CYTOTOXIC EFFECT OF ADANSONIA DIGITATA L ON BREAST CANCER CELL LINES

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ABSTRACT
Adansonia digitata L is an indispensable remedial plant known as "Brahmamlika" in Ayurveda and for the most part used for the treatment of flu, fever, irritation and even the gastric ulcers. In folk medicine it is utilized for antitumor action. The purpose of our present study is to evaluate the cytotoxic activity of Adansonia digitata isolates against the Human Breast development cell lines BT474. The Cytotoxic activity was assessed by MTT test and % block of cells was found out. The results have shown that 30 mg/ml of Methanol concentrate of leaves of the plant exhibited the moderate cytotoxic activity (56 %) against BT474 cell line with IC50 15.3 ± 0.4. Hereafter it develops the way that Adansonia digitata (leaves) has cytotoxic action against human breast tumor (BT474) cell lines.

KEYWORDS: Adansonia digitata L, Brahmanlika.

INTRODUCTION
Force investigation is comprehensively focusing to look out intense and rich pharmaceuticals for Cancer. It is looked for that the interest after compounds have specific antitumor and cytotoxic activities in plants may add to find intense anticancer therapeutics. Starting late it is represented that the various plants have anticancer development like Aspergillus Niger (Channabasava et al., 2014) and Morus nigra (Qadir MI et al., 2014).

Adansonia digitata L. (Malvaceae) is commonly known as baobab tree native to Africa. Baobab is a multi-purpose tree which offers protection and provides food, clothing and medicine as well as raw material for many useful items, locally known as "Brahmamlika", several plant parts have interesting anti-oxidant and anti-inflamatory properties and baobab has been used extensively since ancient times in traditional medicine. (De Caluwé E et al., 2010). It is not found in areas where sand is deep. It is sensitive to water logging and frost. All locations where the tree is found are arid or semi-arid (Salim AS et al., 2012). The plant parts are used to treat various ailments such as diarrhoea, malaria and microbial infections (Kamatou GPP et al., 2011). The seeds, leaves, roots, flowers, fruit pulp and bark of baobab are edible. India has about more than 45 000 plants species and among them several thousand are claimed to possess medicinal properties (Taur DJ et al., 2011). Medicinal plants play an important role in providing knowledge to the researchers in the field of ethnobotany and Ethnopharmacology (Sankaranarayanan S et al., 2010).

Among all malignancy sorts breast tumor is the most widely recognized infection in ladies worldwide with high death rate (18%) and relative danger components, including dietary elements (Gonzalez, A.G et al., 2000).

The central breast tumor cell line to be set up was BT-20 in 1958 (Lasfargues EY et al., 1958). The most commonly used bosom growth cell line as a part of the world, MCF-7 developed in 1973 at the Michigan Cancer Foundation (Soule HD et al., 1973). The unmistakable quality of MCF-7 is, as it were, a direct result of its impeccable hormone affectability through explanation of estrogen receptor (ER), making it a flawless model to study hormone response (Levenson AS et al., 1997). Regardless of these early accomplishments, tolerably few breast cancer cell lines have been developed in the later past, primarily in perspective of difficulties in refined homogeneous populaces without significant stromal sullying and in view of careful.

Breast cancer heterogeneity
Much sooner than the happening to present day nuclear profiling frameworks, histopathologists saw that breast cancer ailment was heterogeneous through morphological recognitions. Classification relied on upon the going with measures: histological sort, tumor grade, lymph hub status and the region of farsighted markers,
for instance, ER and, all the more starting late, human epidermal improvement variable receptor 2 (HER2).

At the point when all is said in done, considers have exhibited that the luminal, basal, HER2 and Claudine-low groups identified in breast tumors can without a doubt be perceived in breast malignancy cell lines (Table 1) [12,13-17]. Of note is the ending that the Claudine-low subtype is all in all over-addressed in chest threat cell lines, conceivably as a result of the straightforwardness of advancement associated with cells that need ERα, PR and HER2. These cell lines give incredible opportunities to the further examination of this phenotype, which will redesign our cognizance of its science. Despite this Luminal A T47D and MCF-7 cells and luminal B BT474 cells confined immovable solid structures indicating intense cell–cell grips. So we have picked the BT 474 cell lines for our exploratory study as a bit of witness of open data.

From this time forward in our present study as a bit of consistent examination, the Dichloro Methane and Methanol concentrate of Adansonia digitata was surveyed for its cytotoxic movement against human breast cancer BT474 cell line.

MATERIALS AND METHODS

Preparation of extracts
The Plant Adansonia digitata were collected from the surrounding places of Kurnool district and it was identified and authenticated by Dr. D swapna sri, Head, Dept of PG Botany, KVR Govt College (W) (A), Kurnool. A.P. INDIA. The shade dried plant material (leaves) then subjected to maceration with dichloromethane and methanol for three days successively. The both dichloromethane and methanol extracts were concentrated by using the rotary evaporator.

Anticancer assay (MTT assay)

Microculture Tetrazolium (MTT) Assay Principle
This Colorimetric assay is based on the capacity of Mitochondria succinate dehydrogenase enzymes in living cells to reduce the yellow water soluble substrate 3-(4, 5-dimethyl thiazol-2-yl)-2, 5-diphenyl tetrazolium bromide (MTT) into an insoluble, blue colored formazan product which is measured spectrophotometrically. Since reduction of MTT can only occur in metabolically active cells, the level of activity is a measure of the viability of the cells (Patel S et al., 2009).

Anticancer action was recorded in 102-well miniaturized scale plates by MTT test. Human breast malignancy cells (BT474) were refined in DMEM (Dulbecco's Modified Eagles Medium), alongside 5% of FBS (Fetal cow-like serum), 100 IU/mL of penicillin and 100 µg/mL of streptomycin in 75 cm2 cups, and kept in 5% CO2 hatchery at 37°C. Tentatively developing cells were gathered, numbered with hemocytometer and weakened with a specific medium. Cell society with the convergence of 1 X 105 cells/mL was arranged and presented (100 µL/well) into 102 well plates. After incubation, medium was evacuated and 200 µL of crisp medium was included with convergences of compounds (1-30µLM). Following 48 hours, 200µL MTT (0.5mg.mL) was added to every well and incubated further for 4 hours. 100 µL of DMSO was added to each well. The degree of MTT measuring so as to lessen was calculated the absorbance at 570 nm. utilizing a miniaturized scale plate peruser. The cytotoxicity was measured as fixation bringing about half development restance (IC50) for BT474 cells. The percent hindrance was dictated by utilizing the accompanying formulae.

\[
\text{% Cell Inhibition} = \left(1 - \frac{\text{Absorbance Sample}}{\text{Absorbance Control}}\right) \times 100
\]

Graph was plotted against concentrations to calculate IC50.

Statistical analysis

A logistic straight backslide model was fit to the data using Microsoft Excel 2013 to process the IC50. The data obtained was imparted as Mean ± SD. An estimation of p<0.05 was considered as critical.

RESULTS AND DISCUSSION

Dichromethane and Methanol extracts of Leaves of Adansonia digitata were evaluated for Cytotoxic and anticancer activity by MTT assay against human breast cancer BT474 cell line. The Cytotoxic activity of extracts is given in Figure1. The dichloromethane extract of leaf showed moderate cytotoxic activity against BT474 cell line with IC50 12.33 ± 0.4 using doxo rubicin as a standard.

In the previous studies It has published that they have observed a captivating results as the leaves of A. digitata was screened for antiangiardial activity against (Giardia lamblia) trophozoites in vitro, and screened for cytotoxicity using 3- (4, 5dimethyl thiazol-2-yl)-2, 5-diphenyl tetrazolium bromide (MTT) Vero cell line (Ahmed Saeed and Amel Mahmoud. 2015).

From now on in this study we have assessed cytotoxic activity of Adansonia digitata against human breast malignancy cell lines BT474. MTT examination showed the anti proliferative action of methanol and dichloromethane extracts of the plant. For both the concentrates, decreasing in cell expansion was dosage dependant. At a dose of 30 mg/ml, there was a wonderful decrease in cell expansion by dichloromethane extract of leaves of Adansonia digitata. At this dose very nearly 42% of the aggregate cells survived and the rest 56% turned out to be dead.

The leuco anthocyanins are type of flavonoid which presence is revealed in Adansonia digitata leaf (O El Yahyaoui et al., 2017). The anticancer activity of flavonoids has already been established (Kandaswami C...
et al., 2005) Hence it establishes the fact that, anti cancer activity of *Adansonia digitata* may be due to the presence of flavonoids of it.

Table 1.

<table>
<thead>
<tr>
<th>Classification</th>
<th>Immunoprofile</th>
<th>Other characteristics</th>
<th>Example cell lines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Luminal A</td>
<td>ER+, PR+/−, HER2−</td>
<td>Ki67 low, endocrine responsive, often chemotherapy responsive</td>
<td>MCF-7, T47D, SUM185</td>
</tr>
<tr>
<td>Luminal B</td>
<td>ER+, PR+/−, HER2+</td>
<td>Ki67 high, usually endocrine responsive, variable to chemotherapy, HER2+ are trastuzumab responsive</td>
<td>BT474, ZR-75</td>
</tr>
<tr>
<td>Basal</td>
<td>ER−, PR−, HER2−</td>
<td>EGFR+ and/or cytokeratin 5/6+, Ki67 high, endocrine nonresponsive, often</td>
<td>MDA-MB-468, SUM190 chemotherapy responsive</td>
</tr>
<tr>
<td>Claudin-low</td>
<td>ER−, PR+, HER2−</td>
<td>Ki67, E-cadherin, claudin-3, claudin-4 and claudin-7 low. Intermediate response</td>
<td>BTS49, MDA-MB-231, to chemotherapy</td>
</tr>
<tr>
<td>HER2</td>
<td>ER−, PR−, HER2+</td>
<td>Ki67 high, trastuzumab responsive, chemotherapy responsive</td>
<td>SKBR3, MDA-MB-453</td>
</tr>
</tbody>
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EGFR, epidermal growth factor receptor; ER, estrogen receptor; HER2, human epidermal growth factor receptor 2; PR, progesterone receptor.

Figure 1.

REFERENCES

Dhanasree et al. European Journal of Biomedical and Pharmaceutical Sciences


