

Breast Cancer and Plant Extractions

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Abstract : In this article, the potential effects of plant extractions against breast cancer will be discussed. Plant extracts are being tested for properties that could help in treating human breast cancer cells since their compounds are considered safer compared to the debilitating effects of modern medicine or synthetic drugs. Several studies were collected in order to identify whether plant extracts are capable of treating human breast cancer such as their cytotoxicity and apoptosis properties.

Keywords: plant extractions, breast cancer, cytotoxicity, apoptosis

I. INTRODUCTION

Breast cancer largely affects women around the world, it is the leading cause of cancer-related deaths. There is a growing scientific research on the potential effects of medicinal plants on combatting breast cancer cells. In the developing countries, large populations still rely on traditional medicine to treat serious diseases including breast cancer. Plants are being studied for their usefulness in fighting cancer because their compounds are much safer compared to synthetic drugs. The Medical community is divided into two camps, one claims that efficient treatment of breast cancer should make use of synthesized chemical compounds only while the other advocates for alternative therapies i.e. natural sources such as plant extracts (Levitsky & Dembitsky, 2015).

2. PLANT EXTRACTIONS FOR BREAST CANCER TREATMENT

2.1 *Withania Somnifera* and *Tinospora cordifolia*

WithaniaSomnifera (WS) and *Tinosporacordifolia* (TC) are traditional plants used for treatment of cancer in India. A recent study examined the effects of these ethanolic extracts and found through MTT-based assays have dose-dependent cytotoxic effects on human breast cancer cells. Numerous tests were conducted on WS and TC for apoptosis and concluded that both plants contain potential anti-cancer activities of their ethanolic extracts against breast cancer cells (Maliyakkal, Udupa, SR Pai, & Rangarajan, 2013).

2.2 Bangladeshi medicinal plants (*Emblicaofficinalis*, *Aeglemarmelos*, *Vernoniaanthelmentica*, *Oroxylum*, *Argemonemexicana*)

E.officinalis and *O. indicum* have shown anti-proliferative activity on MCF7 and MDA-MB-231 breast cancer cell lines. *A. Mexicana* were found active only on MCF7 but having low antiproliferative effects on MDA-MB-231 cells. *A. marmelos* and *V. anthelmentica* were effective in preventing the spread of both cancer cell lines but at higher concentration. Through quantitative reverse-transcriptase polymerase chain reaction (RT-PCR), it was found that *E. officinalis* induce increase of ERalpha mRNA in MCF7 cells. The ERalpha mRNA gene expression is found to have clinical impact on breast cancer. However, when MDA-MB_231 cell line was added, *E. officinalis*, *V. anthelmintica* and *A. Mexicana* were all found to induce the proliferation of ERalpha, mRNA accumulation. The results of the study suggest that medicinal plants identified could be used in identifying compounds that would help in treating breast cancer (Lambertini, et al., 200).

2.3 Kaempferol and naringenin

Kaempferol and naringenin, two flavonoids were observed to have high cytotoxic activity against breast cancer cell lines (MDA-MB-231 and MBA-MB-468) using MTT assay. The leaf

extract of Mersing plant was also found to have higher cytotoxicity against breast cancer cells compared to other leaf extracts(Ayob, Bohari, Samad, & Jamil, 2014).

2.4 *Acoruscalamus*

A recent studyfound that *Acoruscalamus*can effectively kill MCF-7 breast cancer cells, thus should be considered a chemotherapeutic agent for treatment. It was found that the *Acoruscalamus* extract decreases the cell viability of malignant cells through the assessment of MIT assay (Sreejaya & Santhy, 2013).

2.5 *Piper cubeba*

Piper cubeba is another extract found to have highercytotoxicityagainst breast cancer cell lines such as MDA-MB-468 and MCF-7 compared to dichloromethane crude extract(Graidist, Martla, & Sukpondma, 2015).

2.6 *Cannabis*

A study conducted by Ligresti et.al (2006) on the antitumor activities of *Cannabis* extracts showed that among other cannabinoids, cannabidiol is the most effective in inhibiting cancer cell growth, breast carcinoma MDA-MB-231 followed by cannabigerol and cannabichromene among the five types. Based on the results of their experiments, cannabidiol is capable of inducing apoptosis either via direct or indirect aviation of cannabinoid CB2 and vanilloid transient receptor potential vanilloid type 1-receptors. However, more testing should be conducted on the potential of cannabidiol and cannabidiol-extracts to support the data gathered.

2.7 *African medicinal plants*

Jatrophacurcas(JCP1), *Pyrenacanthastaudtii*(PS),and *Picralimanitida* (ZI) and *Jatrophagossypifolia*(JCP2) are African plants that are found to kill breast cancer cells MCF-7in *vitro*in a dose-dependent manner after numerous experiments. In addition, the three plant extracts were considered as potential therapeutic drugs in estrogen receptor positive breast cancer treatment(Engel, et al., 2014).

CONCLUSION

Traditional and modern medicine for breast cancer can be reconciled since the role of plant extracts play the protective role while drugs are able to inhibit the development of tumors. The studies mentioned showed evidence of plant extracts potential to kill human breast cancer cells. However, more studies should be conducted to support the data.

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