ANTI CANCER PROPERTIES OF PLANTS PRESENT IN WEST GODAVARI DISTRICT OF ANDHRA PRADESH, INDIA- A MINI REVIEW

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**ABSTRACT:** Cancer is an very fatal disease characterized by the abnormal growth of cells. Cancer is caused by various factors. Synthetic modern medicines have high toxic effects on other systems of the body such as renal system, circulatory system etc. In order to reduce those toxic effects scientific world is trying to find inhibitors from the herbal sources. Always the plants proved to be effective and efficient in curing fatal diseases. In this review an attempt has been made to review the some of the medicinal plants such as Allium sativum, Aloe vera, Curcuma longa, Picrorhiza kurroa, Withania somnifera, Ananas cosmosus, Annona squamosa etc., of about 10 species that have anti cancerous activity present in west godavari district of Andhra Pradesh, India.

**INTRODUCTION:** Cancer is the abnormal growth of cells in our bodies that can lead to death. Cancer cells usually invade and destroy normal cells. The important preventive methods for most of the cancers include dietary changes, stopping the use of tobacco products, treating inflammatory diseases effectively, and taking nutritional supplements that aid immune functions. Several chemopreventive agents are used to treat cancer, but they cause toxicity that prevents their usage. More than 50% of all modern drugs in clinical use are of natural products, many of which have the ability to control cancer cells. Medicinal plants gaining lot of importance now a days because of efficacy they have been showing in the traditional healing.

Plants used in traditional medicine have stood up to the test of time and contributed many novel compounds for preventive and curative medicine to modern science. The best source of drugs without hazardous effect to human systems could be the plant source and this has been proved by the traditional healing system and the recent studies conducted on the experimental animals.

**Types of Cancers:**

1) **Cancers of Blood and Lymphatic Systems**
   a) Hodgkin's disease, b) Leukemias, c) Lymphomas,
   d) Multiple myeloma, e) Waldenstrom's disease

2) **Skin Cancers:**
   a) Malignant Melanoma

3) **Cancers of Digestive Systems:**
   a) esophageal cancer, b) Stomach cancer, c) Cancer of pancreas, d) Liver cancer, e) Colon and Rectal cancer, f) Anal cancer

4) **Cancers of Urinary system:**

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**Keywords:** Cancer, Herbal sources, Synthetic modern medicines, Medicinal plants

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**DOI:** 10.13040/IJPSR.0975-8232.IJP.3(2).82-86

Article can be accessed online on:
www.ijpjournal.com

DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.IJP.3(2).82-86
a) Kidney cancer, b) Bladder cancer, c) Testis cancer, d) Prostate cancer

5) Cancers in women:
a) Breast cancer, b) Ovarian cancer, c) Gynecological cancer, d) Choriocarcinoma

6) Miscellaneous cancers:
a) Brain cancer, b) Bone cancer, c) Carcinoid cancer, d) Nasopharyngeal cancer, e) Retroperitoneal sarcomas f) Soft tissue cancer, g) Thyroid cancer

Causes of cancer:
Cause of cancer may be various types. They are viral and chemical carcinogens, Tobacco, Ionizing radiations, Heredity, Oncogenes and Tumour suppressor genes, Diet, Immune system, Hormonal imbalance, Occupational exposure, Reproductive factors, Sedentary life style, Alcohol, Drugs and Pollution.

The Mechanism of Cancer Therapy:

1. Cancer cell proliferation inhibited directly by stimulating macrophage phagocytosis, natural killer cell activity enhances.
3. Enforcing the necrosis of tumor and inhibiting its translocation and spread by blocking the blood source of tumor tissue.
4. Stimulating the haemopoietic function to enhance the number of leukocytes and platelets.
5. Promoting the reverse transformation from tumor cells into normal cells.
6. Promoting metabolism and preventing carcinogenesis of normal cells.
7. Stimulating appetite, improving quality of sleep, relieving pain, thus benefiting patients health.

Anti Cancer Plants:

Allium sativum (Amaryllidaceae): Rajeev Nema et al (2014) used Allium Šatívum (Bulb) Polyphenolic Compound activity on MCF-7, A549 and PA-1 cancer cell lines (breast, lung and ovary cancer respectively). Hydro alcoholic (1:1) extract of Allium Šatívum (Bulb) were prepared and tested for their cytotoxic activities against cancer cell lines (MCF-7, A-549 and PA-1) with standard Doxorubicin. The hydro alcoholic extract showed efficient anti cancer activity on breast, lung and ovary cancer cell lines.

Aloe vera (Liliaceae):
Antitumor activity of 50% ethanol extract (100 mg/kg) of Aloe vera was evaluated against Ehrlich ascites carcinoma (EAC) tumor in mice. The extract was administered daily for 14 days. Hematological profile reverted towards normal levels, Aloe vera extract restored the serum biochemical parameters towards normal levels and decreased the levels of lipid peroxidation and increased the levels of reduced glutathione and other antioxidant enzymes (SOD, CAT and GPx). The 50% ethanol extract of Aloe vera exhibited antitumor effect by modulating lipid peroxidation and augmenting antioxidant defense system in EAC bearing mice.

Curcuma longa: (Zingiberaceae)
Hashim et al (2013) evaluated Ethanolic turmeric extracts (ETE) as anticancer agent by detect the apoptotic induction and DNA damage activity of ETE which were investigated against two human leukemic cell lines, U937 (human monocytic leukemia cell line) and Molt4 (human lymphoblastic cell line). Ethanolic turmeric extracts (ETE) showed that have apoptogenenic and DNA damage activity against two human leukemic cell lines.

Picrorhiza kurroa (plantaginaceae):
Hemanth kumar, Ramesh (2014) evaluated the anticancer and cytotoxic potential of Nano encapsulated extract formulation from rhizome of Picrorhiza kurroa enriched with Apocynin, caffeic esters and cucurbitacins aglycone compounds, to produce any cytotoxic effect on mammalian cell lines. The test conducted using MTT method using human hepatocarcinoma cells (HepG2) and Madin Darby Canine Kidney (MDCK) cell lines. Cytotoxic effect against HePG-2 cancer cell line is considered as a predictive anticancer activity.
MDCK cytotoxicity results support that formulation is less cytotoxic in normal cell lines, as MDCK is a Non-Cancerous cell line.\textsuperscript{14}

**Withania somnifera** (Solanaceae): Rajeev Nema et al (2013) determined the use of Withania Somnifera (leaves) Polyphenolic Compound activity on MCF-7, A549 and PA-1 cancer cell line (breast, lung and ovary respectively). Hydro alcoholic (1:1) sample of Withania Somnifera (leaves) were prepared and tested for their cytotoxic activities against cancer cell lines (MCF7, A549and PA1) with standard Doxorubicin. The hydro alcoholic extract showed efficient anti cancer activity on breast, lung and ovary cancer cell lines.\textsuperscript{15}

**Zingiber officinale** (Zingiberaceae): Ginger leaf (GL) has long been used as a vegetable, tea and herbal medicine. Park GH et al (2014) evaluated anti-cancer properties of ginger leaf and then elucidated the potential mechanisms involved. Exposure of GL to human colorectal cancer cells (HCT116, SW480 and LoVo cells) reduced the cell viability and induced apoptosis in a dose-dependent manner. In addition, GL reduced cell viability in MCF-7, MDA-MB-231 and HepG-2 cells.\textsuperscript{16}

**Ananas cosmosus** (Bromiliaceae): Stem bromelain (EC 3.4.22.32) is a major cysteine proteinase, isolated from pineapple (*Ananas cosmosus*) stem. To verify the identity of the principle in stem fractions responsible for the antitumoral effect, bromelain was isolated to probe its pharmacological effects. The isolated bromelain was obtained from stems of adult pineapple plants by buffered aqueous extraction and cationic chromatography.

The in vivo antitumoral/antileukemic activity was evaluated using the following panel of tumor lines: P-388 leukemia, sarcoma (S-37), Ehrlich ascitic tumor (EAT), Lewis lung carcinoma (LLC), MB-F10 melanoma and ADC-755 mammary adenocarcinoma. Bromelain shown efficient anti cancerous effects on above all cell lines.\textsuperscript{17}

**Annona squamosa** (Annonaceae): Seeds of *Annona squamosa* L. have been used in the south of China as a folk remedy to treat "malignant sores" (cancer). To investigate the chemical constituents and the anti-tumor activity of the standardized *A. squamosa* seeds extract in vitro and in vivo. Annonaceous acetogenin profiles of the standardized extract were determined by using Fourier transform infrared (FT-IR) and high performance liquid chromatography (HPLC) techniques. Two major annonaceous acetogenins: 12, 15-cis-squamostatin-A and bullatacin were identified and quantified by HPLC.

The seed extract showed significant anti-tumor activity against four human tumor cell lines, especially for MCF-7 (IC(50) 0.25 μg/ml) and Hep G2 (IC(50) 0.36 μg/ml) cells in vitro. The extract Inhibited the growth of H(22) tumor cells in mice with a maximum inhibitory rate of 69.55% by oral administration. *A. squamosa* seed extract showed significant anti-tumor activities against human hepatoma cells in vitro and in vivo, indicating a potential for developing the extract as a novel anti-liver cancer drug.\textsuperscript{18}

**Mentha citrata and Mentha longifolia** (Lamiaceae) Sahar Y Al-Okbi et al (2015) studied the anti-cancer and antioxidant activity of two nutraceuticals (mixtures of different extracts) prepared from *Mentha citrata* and Mentha longifolia aerial parts separately. The anti-cancer activity was evaluated in three cancer cell lines. Results showed inhibition of the three tested cancer cells (liver, cervix and colon carcinoma) by the tested nutraceuticals with variable degrees. *Mentha citrata* and *Mentha longifolia* possess antioxidant and anticancer effect that could be attributed to the presence of phytosterols, phenolic compounds, unsaturated fatty acids and specific volatile constituents.\textsuperscript{19}

<p>| TABLE 1: SHOWS ANTI CANCER COMPOUNDS FROM PLANTS |
|---------------------------------|---------------------------------|----------------|</p>
<table>
<thead>
<tr>
<th>S.No</th>
<th>Anti cancer compound</th>
<th>Reference</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Withanolides, a steroidal lactones found in Solanacea plants, exhibits potential anticancer activities.</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Ursolic acid, induced apoptosis in K562 cells involving upregulation of PTEN gene expression and inactivation of the PI3K/Akt pathway.</td>
<td>21</td>
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<tr>
<td>3</td>
<td>Carnosic acid, inhibited the proliferation and migration capacity of human colorectal cancer cells.</td>
<td>22</td>
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</table>
### CONCLUSION

As the severity of cancer is very high it is the responsibility of the scientific community to find inhibitors from the natural plant sources because of lack of anarchic side effects and efficacy. Plants proved to be effective in curing lot of deadly diseases. The above mentioned plants have anti-cancerous activity so that this review will be useful for the further studies to find effective drugs from natural plant sources. Still there are lot of plants to be explored for anti-cancerous activity.

### ACKNOWLEDGEMENTS

Authors wish to thank Professor, B V Sandeep Head of the Department of Biotechnology Andhra University and Dr. Sudhakara Rao Pola, Dr. P. Bindiya for their continuous support.

### REFERENCES


