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Review Article

Herbal Drugs Used as Anticancer Agent

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ABSTRACT

Cancer is a major health issue in the world causing an uncontrollable division of abnormal cell in the body and destroy body tissue leading to death of the person. There are over 100 types of cancer. They are usually named for the organ or tissue where the cancer form. There are many drugs available for treatment of cancer but no drug is found effective and safe. Herbal medicines have a vital role in prevention and treatment of cancer. They show their anti-cancer effect by inhibiting cancer activating hormones and enzymes, repairing DNA, enhancing immunity of body and producing protective enzymes. More than 50% of modern drugs in clinical use are of natural products. In the present review, an attempt has been made to study the plants that have been used in the treatment of cancer.

INTRODUCTION

1.1. Herbal Formulations:

Although there are many different Ayurvedic methods and approaches to health, studies of herbs and botanical formulations make up the majority of published Ayurvedic research. Hundreds of Ayurvedic herbs have been utilized for approved medical purposes for millennia, as documented in Ayurvedic scriptures (Arnold Julia T 2023). Many therapeutic plants have anticancer properties and can be used to treat clinical and/or experimental malignancies and tumors of different organs. Sarcoma, leukemia, lymphoma, and carcinoma are

a few of those malignancies. Medicinal herbs are recognized for their diverse antioxidant and immunomodulatory qualities, which result in anticancer effects. They work by promoting both innate immunity and acquired immunity. By restoring bodily balance and training bodily tissue, they could enhance host resistance to infection. (Pandey Govind 2011). It is well known that several biological response modifiers obtained from herbs might impede growth. While herbal extracts are generally helpful, it should be noted that in pediatric oncology situations, there may be some herb-drug interactions between medications

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and herbal medicines. This is because conventional drugs usually have one pharmacologically active component, whereas herbal agents often contain multiple. Many patients use specific complementary and alternative medicine (CAM) techniques in the hopes that the tumor would respond therapeutically, potentially curing their illness. The general public believes herbal medications to be safe, to have fewer adverse effects, and to reduce the risk of drug dependency. However, the use of complementary and alternative medicine (CAM) in cancer treatment is not well studied in English clinical research, which has limited the number of studies on anticancer treatments. (Ali Mohammadi *et al* 2017).

It has been shown that vitamin and herbal components can treat over 60% of cancer cases. Since ancient times, herbal medicines (HMs) have been used to treat a wide range of ailments and alleviate pain due to their superior biological qualities. Additionally, HMs have shown amazing antitumor properties. In addition to inducing apoptosis, regulating mRNAs, raising the amounts of those protecting enzymes, boosting the immune system, and exerting antioxidant activity, HM components also activate DNA repair pathways. The World Health Organization states that because chemotherapy is expensive, 80% of village residents rely solely on HMs as their primary healthcare provider. Normal cells in the body are also impacted by the chemicals and radiation therapy used to treat cancer cells. (Abdulridha MK *et al* 2020)

1.2. Cancer:

The word "cancer" refers to a broad category of malignant illnesses that can affect various bodily sections. These disorders are typified by the fast and uncontrollably forming aberrant cells that can aggregate to create a growth or tumor or spread throughout the body to trigger aberrant growth at other locations. If the process is not stopped, it can

continue until the organism dies. Surgery, radiation therapy, and pharmaceuticals (cancer chemotherapeutic agents) are the primary treatment modalities for advanced stage cancer in humans. Chemotherapeutic treatments for cancer can sometimes cure the disease as well as prolong its course and temporarily relieve its symptoms. Though they have greater adverse effects, many hundreds of chemical variations of the known class of cancer chemotherapeutic drugs have been synthesized.

1.3. Ayurvedic Concept of Cancer:

The Samhita Charaka and Sushruta called the corresponding conditions to cancer "granthi" and "arbuda." "Granthi" and "Arbuda" may cause inflammation or not depending on the doshas at play. Disease is caused by the body's "Vata, Pitta, and Kapha" doshas; the Ayurvedic concept of health is the harmonious balancing of these doshas in the body, mind, and consciousness. Tridoshicarbudas typically result in a morbid condition because all three major body humors lose mutual coordination, making them cancerous. According to Ayurveda, neoplasms can be categorized based on a range of clinical signs related to tridoshas.

2. Causes:

- Tobacco
- Alcohol
- Diet
- Food additives
- Reproductive and sexual behavior
- Occupation
- Pollution
- Medicines and medical procedures
- Geophysical factors
- Infection

3. Symptoms:

- Unexplained Weight Loss: Significant weight loss without trying.



- Fatigue: Persistent tiredness that doesn't improve with rest.
- Pain: Ongoing pain that may be localized or widespread.
- Skin Changes: New moles, changes in existing moles, or yellowing of the skin.
- Changes in Bowel or Bladder Habits: Diarrhea, constipation, or changes in urinary frequency.
- Unusual Bleeding or Discharge: Blood in stool, urine, or unexpected vaginal bleeding.
- Lumps or Swellings: New lumps in the breast, testicles, or other parts of the body.
- Persistent Cough or Hoarseness: A cough that doesn't go away or voice changes.
- Difficulty Swallowing: Trouble swallowing or persistent indigestion.
- Changes in Appetite: Decreased appetite or feelings of fullness.
- Blood in vomiting.
- Sore that does not heal.
- Post menopausal bleeding

3.Types of Cancer: (Bijauliya R.K et al 2017)

1) Cancers of Blood and Lymphatic Systems:

1. Hodgkin's disease
2. Leukemia's
3. Lymphomas
4. Multiple myeloma

2) Skin Cancers:

1. Malignant Melanoma

4.Cancers of Digestive Systems:

1. Esophageal cancer
2. Stomach cancer
3. Cancer of pancreas
4. Liver cancer
5. Colon and Rectal cancer
6. Anal cancer

4) Cancers of Urinary system:

1. Kidney cancer
2. Bladder cancer
3. Testis cancer

4. Prostate cancer

5)Cancers in Women:

1. Breast cancer
2. Ovarian cancer
3. Gynecological cancer
4. Choriocarcinoma

6)Miscellaneous Cancers:

1. Brain cancer
2. Bone cancer
3. Characinoid cancer
4. Nasopharyngeal cancer
5. Retroperitoneal sarcomas
6. Soft tissue cancer
7. Thyroid cancer

5.Breast cancer:

Breast cancer is the most common cancer and also the primary cause of death due to cancer in female around the World. About 1.38 million new breast cancer cases are diagnosed every year with almost 50% of all breast cancer patients and approximately 60% of deaths occurring in every countries. Developing countries face resource and infrastructure constraints that challenge the objective of improving breast cancer outcomes by timely recognition, diagnosis and management. Different modern medicines are prescribed to treat breast cancer. Medical therapy of breast cancer with antiestrogens such as raloxifene or tamoxifen might avoid breast cancer in individuals who are at increased possibility of developing it.

(Muhammad et al 2017)

5.1Types of breast cancer:

- Non-invasive breast cancer
- Lobular carcinoma in situ (LCIC)
- Ductal carcinoma in situ
- Invasive breast cancer
- Paget's disease of the breast
- Phyllodes tumor
- Triple-negative breast cancer
- Pathogenesis of breast cancer
- Causative factors and associated risks of breast carcinoma

- A global prospective
- Infiltrating ductal carcinoma
- Medullary carcinoma
- Mucinous carcinoma
- Tubular carcinoma
- Inflammatory breast cancer

5.2. Stages of breast cancer: (Koo MM et al 2017)

Based on the breast cancer report. The size, nature, and extent to which the tumor cells have infiltrated the breast tissues determine the stage of breast cancer. On the other hand, a tumor in stage 0 is non-invasive, whereas one in stage 4 is invasive. The phases of those tumors are:

Stage 0: This is the non-invasive stage of a tumor, meaning that there is no indication of cell invasion in the surrounding tissues and that both cancerous and non-cancerous cells are contained within the confines of the breast region where the tumor starts to form.

Stage 1: This phase is characterized as invasive breast cancer, and microscopic invasion may occur. There are two categories: 1A and 1B stage. While stage 1B describes a small collection of cancer cells larger than 0.2 mm discovered in lymph nodes, category 1A describes a tumor that is up to 2 cm in size and does not involve any lymph nodes.

Stage 2 : There are two divisions in Stage 2 as well: 2A and 2B. Stage 2A indicates that there is no tumour in the breast but that the tumour is located in the sentinel or axillary lymph nodes. The tumour cannot be greater than 5 cm, however it can be less or larger than 2 cm. Stage 2B, however, indicates that the tumour may be more than 5 cm in size but is unable to reach the lymph nodes in the axilla.

Stage 3 : The third stage is separated into three subcategories, which are 3A, 3B, and 3C. Of these, stage 3A indicates that there is no tumour in the breast but that it may be present in 4–9 axillary lymph nodes or sentinel lymph nodes, whereas

stage 3B indicates that the tumour may be any size but that it has resulted in breast skin swelling or ulceration and may have spread to up to 9 axillary lymph nodes or sentinel lymph nodes. Inflammatory breast cancer, or stage 3B, is characterised by red, heated, and swollen breast tissue. But stage 3C indicates that the tumour has progressed to ten or more axillary lymph nodes, and it has also impacted the below and above the collarbone are lymph nodes.

Stage 4: This stage denotes the spread of cancer to other body organs, such as the liver, brain, lungs, and bones. It is the advanced and metastatic stage of the disease.

Symptoms:

- Breast lump and nipple abnormalities
- Breast pain and breast skin abnormalities
- Axillary lump
- Breast ulceration
- Back pain
- Breast contour abnormalities
- Breast infection or inflammation
- Breast swelling
- Musculoskeletal pain
- Breathlessness

5.2 Herbs used in breast cancer : (McGrowder et al 2020)

- Ginseng
- Curcuma longa
- Camellia sinensis
- Echinacea
- Arctium lappa
- Flaxseed
- Nigella sativa
- Garlic

6. Prostate cancer:

One of the most prevalent cancers and the second most common cause of cancer-related deaths in males is prostate cancer. Malignant cells that start in prostate tissues and grow erratically are known as prostate cancer. This type of cancer causes the



volume of each of the prostate gland's cellular components to expand. Prostate cancer is more common in older men. many studies have revealed that 40% of men in their 30s-40s have shown histological evidence of prostate adenocarcinoma. Prostate cancer is caused by several factors such as age, race, diet and heredity. Most of the plants used in this have antioxidant activity, which is due to the presence of phenolic compounds. Nettle is known to exhibit positive effect on the treatment of BPH. The main activity of nettle seems to be exerted by disrupting dihydrotestosterone binding to cytosol and nuclear receptors, explaining the role of the plant in preventing prostate cancer.

(Basati Gholam *et al* 2019)

6.1Symptoms:

Difficulty in passing urine

- Loss of appetite
- Weight loss
- Bone pain
- Pain in pelvis, lower back or hips
- Erectile dysfunction
- Blood in urine
- Weak urine flow
- Difficulty urinating
- Frequent urge to urinating
- Painful ejaculation
- Blood in semen
- Swelling in lower extremities
- Burning urination

6.2Herbs used in prostate cancer:

- Panax ginseng
- Arum palaestinum
- Androsace
- Artemisia
- Salvia trilloba
- Ocimum tenuiflorum
- Acanthopanax
- Embelia ribes
- Coptis chinensis
- Fraxinus

- Psidium guajava
- Ganoderma lucidum
- Litchi chinensis
- Pronus africana
- Saussurea costus

7. Mechanism on Cancer Therapy:

1. Directly preventing the growth of cancer cells by promoting the phagocytosis of macrophages and increasing the activity of natural killer cells.
2. Encouraging cancer cells to undergo apoptosis by raising blood serum levels of implement, interleukin 2 interferon and immunoglobulin.
3. By obstructing the tumors' blood supply, pushing the cancer to necrotize and preventing its translocation.
4. Stimulating haemopoietic activity to increase leukocyte and platelet counts. Encouraging the conversion of cancer cells back into healthy cells.
5. Increasing metabolism and halting the development of cancer in healthy cells.

7.1. Oncogenes and Tumor Suppressor Genes:

The oncogenes are known as the first class of genes, which are involved in several cellular processes such as cell division. An overexpression of these genes turns a healthy cells into cancerous cell. However, the second gene group, known as tumors suppressor genes, prevents the development of cancer cells through various means. Oncogenes are overexpressed in cancer cells, whereas tumors suppressor genes are under expressed. summarizes the key tumor suppressor genes and oncogenes, as well as how they contribute to the emergence of cancer. Oncogenes and their byproducts make good targets for cancer therapy. An enzymes topoisomerases, which unwind DNA during replication, are among the other targets. The variety of naturally occurring compounds produced from herbal plants can offer medicinal treatments that target various cancer cell targets. (Bijauliya Rk *et al* 2017).



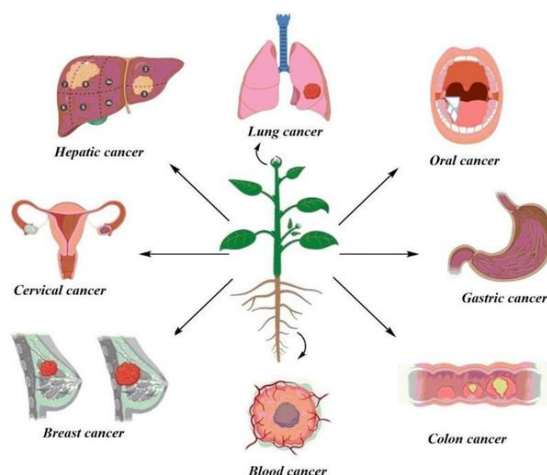


Fig no.1: Illustration of activity of plants against several types of cancer

8. Some Important Medicinal Plants or Phytoconstituents with Anticancer activities:

- Aeglemarmelos Correax Roxb
- Allium cepa Linn.
- Allium sativum Linn.
- Aloe vera Tourn. ex Linn/A. barbadensis Mill.
- Alpiniagalanga Willd.
- Berberisvulgaris Linn.
- Glycyrrhizaglabra Linn.
- Glycyrrhizaglabra Linn.
- Malus domestica Borkh /M. pumila Mill/M. Communis DC/M. sylvestris Hort., non-Mill/Pyrus malus linn.in

8.1 Aeglemarmelos Correax Roxb. (Bael: Family: Rutaceae)

Lupeol, isolated from pulp and seeds of *A. marmelos*, possesses strong anticancer activity against breast cancer, malignant lymphoma, malignant melanoma, malignant ascites and leukemia. *A. marmelos* possesses significant antioxidant activity and reduces side effects of chemotherapy and radiotherapy.

8.1.1. Bael as an Anticancer Agent:

Preclinical studies have shown that Bael leaf extracts were effective in inhibiting the growth of leukemic K562, T-lymphoid Jurkat, B-lymphoid Raji, erythroleukemic HEL, melanoma Colo38, and breast cancer cell lines MCF7 and MDA-MB-231.12,13 The hydroalcoholic extract of the Bael leaves is also shown to possess antineoplastic

effects on the Ehrlich ascites carcinoma in Swiss albino mice.14 The ethanolic extract of the fruit is also shown to possess cytotoxic effect on SKBR3 (human breast adenocarcinoma cells) in vitro.15 Studies have also shown that treatment with the Bael extract did not increase ER α mRNA levels in MCF7 cells and MDA-MB.

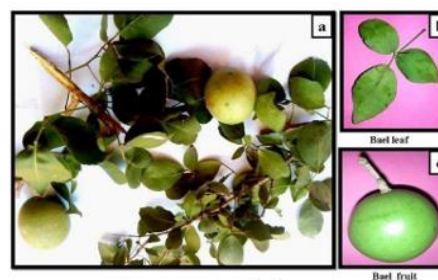


Fig no.2: Bael plant

8.2. Allium cepa Linn.

(Piyaz/Onion; Family: Liliaceae/ Alliaceae) *Helicobacter pylori* is inhibited by Diallyl disulphide, quercetin flavonoid, allicin, allin and vitamins (C, E), isolated from bulb of *A. cepa*, detoxify carcinogen and it also arrest cell cycle from S to G2M phase.

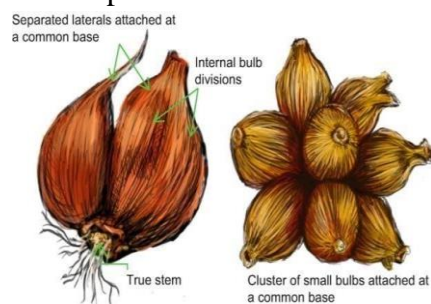


Fig no.3: onion

8.3. *Allium sativum* Linn. (Lasun/garlic; Family: Liliaceae/Alliaceae)

Sulphur compounds (diallyl sulphide, diallyl disulphide, allyl propyl disulphide) and allicin have been isolated from *A. sativum* bulb. Allicin inhibits growth of stomach, liver, colon, breast and endometrium cancers; while Sulphur compounds inhibit the cancer cells.



Fig no.4: Garlic

8.4. *Aloe vera tourn ex linn./A.Barbadensis* Mill.

Acemannan (a polysaccharide) extracted from the root, pulp, leaves, or aerial parts of *A. vera* stimulates the immune system and has substantial anticancer action. Emodin and lectins derived from this herb have potent anticancer and immunoenhancing properties. Aloe-emodin prevents the growth and spread of stomach cancer and other sarcomas by inducing apoptosis. Aloe-emodin exhibits specific anticancer action against neuroectodermal tumours. Alexin B isolated from *A. vera* has potent anticancer action against leukemia. Its polysaccharides have potent immuno-enhancing and anticancer effects. *A. vera* includes "super carbohydrates" that protect against certain malignancies, including liver cancer. This herb prevents cancer origin, development, and metastasis. *A. vera* activates macrophages and releases cytokines that stimulate the body's immunological response. (Pandey Govind 2011).



Fig no.5: Aloe vera

9. Use of herbal supplement as adjuvants in conventional Anticancer therapies:

Herbal medicines in general were used in conjunction with traditional chemotherapy in the aforementioned adjuvant anticancer therapy studies with the hopes of improving therapeutic benefit and quality of life (QoL) while reducing side effects or problems. Herbal medicines are claimed to have been utilized in the treatment of between 28% and 98% of ethnic Chinese cancer patients in Asia [72–74] and between 25% and 47% of those in North America [75, 76]. The majority of clinical trials or research have been reported mostly, if not exclusively, in China or other Asian nations, and they are hardly cited on PubMed, despite the fact that several herbal medications have been proven to be adjunctive in chemotherapy and radiation therapy. (Yin S.Y *et al* 2013)

10. Induction of Cancer Cell Apoptosis by Herbal Compounds:

Anticancer medications should kill the malignant cell with the least amount of harm to healthy cells, most often by causing apoptosis. Apaf1/caspase-9-caspases-3 and Fas/TNF receptor-1-caspase-8-caspase-3 are two pathways that cause apoptosis. One characteristic of cancer is resistance to apoptosis. Numerous herbal substances cause cancer cells to undergo apoptosis, suggesting effective antitumor substitutes. For this reason, herbal substances such as podophyllotoxin, vinca alkaloids, taxans, and camptothecins have been used in therapeutic settings. Anticancer substances found in human nutrition include phenols,

curcumin (by blocking the NF κ B pathway up to 8000 mg/day), ginger, resveratrol (by increasing CD95L expression and CD95 signaling), genistein, and β -lapachone-genistein (by preventing tyrosine kinases, angiogenesis, and cell cycle arrest in the G2/M phase), biocalein (by stimulating quercetin by releasing cytochrome-c into the cytosol and activating caspase-9), alkaloids (7-hydroxystaurosporine by preventing the cell cycle in the G1 phase in ovarian cancer cells), lectines (*Viscum album* L.), terpenoid (by suppressing and reducing ornithine decarboxylase and cyclooxygenase-2 or cox-2 and matrix metalloproteinase 9 or MMP 9), and taxans (by stopping mitosis in metaphase and anaphase). (Abdulridha MK *et al* 2020)

Table 1: List Of Anticancer Plant: (Bijauliya Rk *et al* 2017)

Sr No.	Plant Source	Family	Active Constituents	Use
1	<i>Actinidia chinensis</i>	Actinidiaceae	Saponin, alkaloids, coumarin, isoflavonoids, hecogenin, Vitamins A, B, C	Immune-enhancing, anticancer
2	<i>Aegle marmelos</i>	Rutaceae	Alkaloid, coumarin	Breast cancer, lymphoma, malignant melanoma, cytotoxic, antitumor
3	<i>Agave americana</i>	Agavaceae	Agavegenin	Anticancer
4	<i>Allium sativum</i>	Amaryllidaceae	Allicin	Cytotoxic, anticancer
5	<i>Aloe vera</i>	Asphodelaceae	Aloe-emodin	Anticancer
6	<i>Alpinia galangal</i>	Zingiberaceae	Acetoxy-chavicol-acetate (ACA), Pinocembrin, Galangin	Breast, lung, stomach, colon, prostate cancer; antimutagenic
7	<i>Amoora rohituka</i>	Meliaceae	Amooranin (triterpene acid)	Breast and cervical cancers, cytotoxic, immune-stimulating activity
8	<i>Andrographis paniculata</i>	Acanthaceae	Flavonoids, labdane diterpenoids	Breast and cervical cancers, cytotoxic, immune-stimulating activity
9	<i>Annona muricata</i>	Annonaceae	Acetogenins	Anticancer, cytotoxicity in human lymphocytes and HL-60 cells
10	<i>Apis mellifera</i>	Apidae	Protein	Antitumor
11	<i>Ananas comosus</i>	Bromeliaceae	Bromelain	Cytotoxic activity, leukemia
12	<i>Angelica sinensis</i>	Apiaceae	Polysaccharide "AR-4"	Antitumor activity, cervix cancer, leukemia, sarcoma, pancreatic
Sr No.	Plant Source	Family	Active Constituents	Use
13	<i>Annona</i>	Annonaceae	Acetogenin	Breast cancer
14	<i>Arctium lappa</i>	Asteraceae	Arctigenin	Anticancer
15	<i>Artemisia asiatica</i>	Asteraceae	Flavonoid, terpenes, monoterpenes	Anti-tumor
16	<i>Astragalus membranaceus</i>	Fabaceae	Swainsonine	Liver cancer
17	<i>Autumn Crocus</i>	Liliaceae	Colchicine	Chemotherapeutic, anticancer

18	<i>Azadirachta indica</i>	Meliaceae	Limonoids, Nimbolide	Antimutagenic, anticancer (breast, lung, liver, oral cavity)
19	<i>Bauhinia variegata</i>	Caesalpiniaceae	Cyanidin glucoside, kaempferol galactoside	Anticancer
20	<i>Berberis vulgaris</i>	Berberidaceae	Berberine	Anticancer, immune-enhancing, antioxidant, anti-inflammatory
21	<i>Betula alba</i>	Betulaceae	Betulinic acid	Prostate cancer, diuretic, anti-inflammatory
22	<i>Betula utilis</i>	Betulaceae	Betulin	Liver and lung cancer
23	<i>Bidens pilosa</i>	Asteraceae	Phenyl-1,3,5-heptatriyne	Anticancer
24	<i>Bolbostemma paniculatum</i>	Cucurbitaceae	Tubeimoside-V	Cytotoxic activity
25	<i>Camellia sinensis</i>	Theaceae	(-)-Epigallocatechin gallate	Anti-mutagenic
26	<i>Cannabis sativa</i>	Cannabaceae	Cannabinoids	Anti-tumor (Hodgkin's disease, breast, lung, bladder, cervix cancer)
27	<i>Catharanthus roseus</i>	Apocynaceae	Vinblastine, vincristine	Anti-tumor activity
28	<i>Chlorella pyrenoidosa</i>	Chlorellaceae	Lysine, albumin	Anticancer
29	<i>Cinnamomum cassia</i>	Lauraceae	Coumarin	Anticancer, antimutagenic activity
30	<i>Colchicum luteum</i>	Liliaceae	Colchicine	Anticancer, mitotic inhibition
31	<i>Combretum caffrum</i>	Combretaceae	Combretastatin	Anticancer
32	<i>Coriandrum sativum</i>	Apiaceae	Beta-carotene, quercetin, rutin	Anti-cancer, stomach, colon cancer, antimutagenic
Sr No.	Plant Source	Family	Active Constituents	Use
34	<i>Daphne mezereum</i>	Thymelaeaceae	Mezerein	Antileukemic activity
35	<i>Echinacea angustifolia</i>	Asteraceae	Arabinogalactan	Anticancer
36	<i>Emblica officinalis</i>	Phyllanthaceae	Emblicanin A and B, quercetin	Hepatoprotective, anticancer properties
37	<i>Fagopyrum esculentum</i>	Polygonaceae	Amygdalin	Anticancer
38	<i>Ginkgo biloba</i>	Ginkgoaceae	Ginkgolides (A & B)	Skin, brain tumors, leukemia
39	<i>Glycine max</i>	Fabaceae	Genistein, daidzein	Anticancer
40	<i>Glycyrrhiza glabra</i>	Fabaceae	Licochalcone-A, Glycyrrhizin	Anticancer
41	<i>Gossypium barbadense</i>	Malvaceae	Gossypol	Colon, lung, prostate, breast, brain cancer
42	<i>Gossypium hirsutum</i>	Malvaceae	Tannin, phenol	Antitumor
43	<i>Gunnera perperna</i>	Gunneraceae	Z-venusol	Anticancer

44	Gyrophora esculenta	Umbelicariaceae	Not specified	Carcinogenesis and metastases, antibacterial, antioxidant
45	Indigofera tinctoria	Fabaceae	Flavonoids, saponins, tannins, phenols, anthraquinone	Carcinogenesis and metastases, cytotoxic
46	Justicia procumbens	Acanthaceae	6'-hydroxy justicidin A (JR6)	Anti-cancer effects
47	Lentinus edodes	Polyporaceae	Lentinan, terpenoids, steroids	Antitumor activity, antithrombotic activity
48	Linum usitatissimum	Linaceae	Lignans	Anticarcinogenic
49	Mentha species	Lamiaceae	Monoterpene ketones, phenolic compounds	Anticancer

CONCLUSION:

This article highlights the contributions of herbal formulation to human health, mainly in cancer treatment. These herbal plants have bioactive compounds that demonstrate significant anticancer activity, including immunomodulatory and antioxidant properties. The careful selection and use of these plants can play a crucial role in enhancing cancer management strategies. Furthermore, this review highlights the importance of exploring and harnessing novel anticancer drugs derived from medicinal plants of foreign origin, which are utilized globally. This article also highlights various important plants and its uses in cancer treatment and mechanism of cancer cell apoptosis by herbal compounds. In summary, this paper emphasizes how important herbal formulations are to improving cancer treatment. Numerous therapeutic advantages are provided by the bioactive substances present in medicinal plants, especially through their immunomodulatory and antioxidant qualities, which have been demonstrated to greatly increase anticancer efficacy. When carefully chosen and integrated into treatment plans, these plants may be able to supplement traditional medicines and support more individualized and comprehensive approaches to cancer care. Furthermore, there are exciting prospects for innovation in cancer therapy due to the increased interest in finding and using

novel anticancer drugs derived from plants, particularly those from uncharted and distant places. These plants may have special ways of working, such as causing cancer cells to undergo apoptosis, preventing tumor growth, and altering cellular signaling.

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