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A Review Article On Anti-Cancer Herbal Medicinal Plants

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Abstract

Cancer is a complex and multifactorial disease that continues to be a major health concern worldwide. Despite significant advances in conventional cancer therapies, there is a growing interest in exploring alternative and complementary approaches to cancer treatment. Herbal natural products have been used for centuries in traditional medicine to prevent and treat various diseases, including cancer. This review highlights the potential of herbal natural products as anti-cancer agents, focusing on their bioactive compounds. Phytochemicals have selective activities that are targeted towards tumour cells. The complex process known as carcinogenesis involves a number of signalling cascades. Phytochemicals are thought to be attractive prospects for the development of new therapeutics because of their pleiotropic effects on the target event in a number of ways."Researchers are looking at which of these phytochemicals might be possibilities for inhibiting or reducing the growth of cancer cells without causing any unfavourable side effects. There are a lot of phytochemicals and the analogues they were made from that have been identified as potential anticancer therapeutic possibilities. An effort has been made to highlight the most recent developments and noteworthy accomplishments in phytomolecule-based cancer therapies that target nuclear and cellular components through this succinct overview.

Keywords: anticancer,medicinal pants, bio active compounds

INTRODUCTION

Uncontrolled cellular proliferation within the body is cancer. It can be debatable whether or not common plants, herbs, and foods can act as anticancer agents. About 35000 plant species have been examined by the National Cancer Institute (NCI) for their powerful anticancer properties[1].Herbal medicine has become a very safe, non-toxic, and easily available source of cancer-treating the use of conventional chemicals bears side effects and toxicities [2]. But as the problem persists, new approaches are needed for the control of diseases, especially, because of the failure of conventional chemotherapeutic approaches. Therefore, there is a need for new strategies for the prevention and cure of cancer to control the death rate because of this disease. Herbs are believed to neutralize the effects of diseases in a body because of various characteristics they possess[3]One will only believe in the benefits of chemotherapy for every person who thinks that plants and herbs can weaken or even destroy cancer cells. Here is a list of herbs and medicinal plants that have been the subject of scientific research and have shown promise in the fight against cancer, even though there is still more to be done in this field [4]

CANCER AND ITS CLASSIFICATION

Cancer is a general term applied of series of malignant diseases that may affect different parts of body. These diseases are characterized by a rapid and uncontrolled formation of abnormal cells, which may mass together to form a growth or tumor, or proliferate throughout the body, initiating abnormal growth at other sites. If the process is not arrested, it may progress until it causes the death of the organism. The main forms of treatment for advance stage cancer in humans are surgery, radiation and drugs (cancer chemotherapeutic agents). Cancer chemotherapeutic agents can often provide temporary relief of symptoms, prolongation of life, and occasionally cures[5] In recent years, a lot of effort has been applied to the synthesis of potential anticancer drugs. Many hundreds of chemical variants of known class of cancer chemotherapeutic agents have been synthesized but have a more side effects. A successful anticancer drug should kill or incapacitate cancer cells without causing excessive damage to normal cells. This ideal is difficult, or perhaps impossible, to attain and is why cancer patients frequently suffer unpleasant side effects when under-going treatment6 [6] There is a continued need for new prototype-new templates to use in the design of potential chemotherapeutic agents: natural products are providing such templates. Recent studies of tumor-inhibiting compound of plant origin have yielded an impressive array of novel structures [7]

TYPES OF CANCERS (8)

1. **Cancer of skin and lymphatic system**
   a. Hodgkin's disease
   b. Leukemia's
   c. lyphoma
   d. Multiple myeloma
   e.waldenstroms disease
2. **Skin cancer**
   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**
   a.kidney cancer
   b.Testies cancer
   c.prostate cancer
   d.Bladder cancer

5. **cancers in womans**

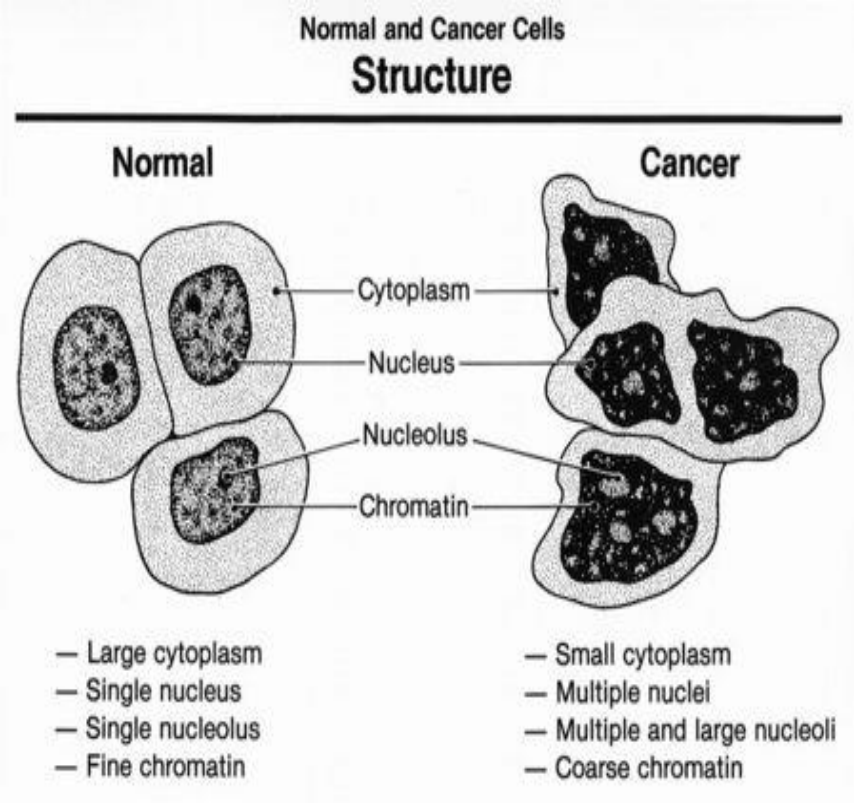
   a. Breast cancer

   b. Gynocology cancer

   c. ovarian cancer

6. **Miscellanous cancer**

   a. a) Brain cancer b) Bone cancer c) Characinoid cancer d) Nasopharyngeal cancer e) Retroperitoneal sarcomas f) Soft tissue cancer



Pathophysiology Of Cancer;

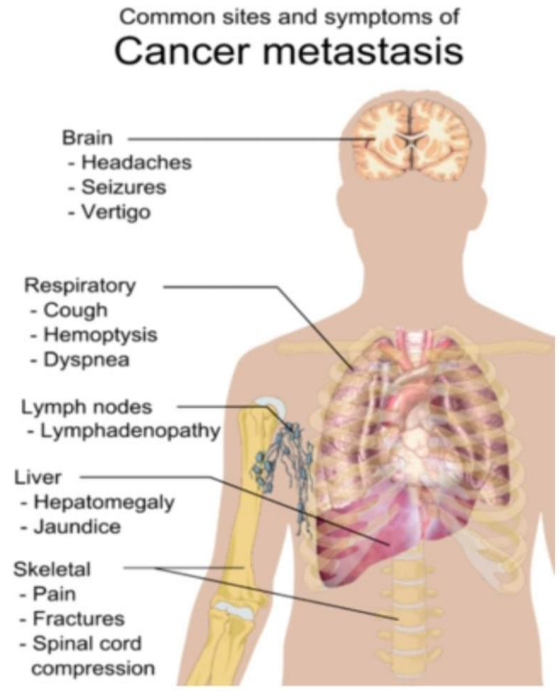
The Pathophysiology of Cancer Includes the Physical and Hormonal Changes Associated with Cancer And Paraneoplastic Syndrome. The Pathological Stage of Cancer Is Determined Through Biopsy, Where the Cancerous Cells Are Compared to Normal Cells. The Four Mainb Stages of Cancer Are;

Stage 1- Cancer Is Normally Localized in Small Area.

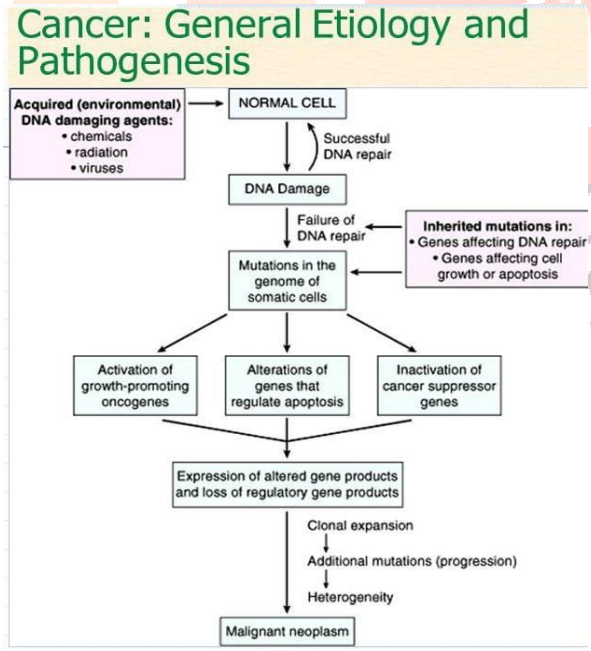
Stage 2- The Size of Cancer Increases

Stage 3- The Size of Cancer Becomes Larger and Starts Spreading to Some Parts of The Body Including Lymph Nodes

Stage 4; Cancer Has Grown And Has To Spread Of The Body



Metastasis of Cancer Cells in Various Body Parts



Types Of Cancer Treatment

There Are Many Types of Cancer Treatment. Some People With Cancer Have Only One Treatment. But Most People Have Combination Of Treatments, Such As Surgery With Chemotherapy And Radiation Therapy.

The Types Of Treatment That You Receive Will Depend On The Type Of Cancer You Have And How Advanced It Is. To Learn More About How Specific Cancers Are Treated, See The Cancer Treatment Information For Adult And Childhood Cancers. Our List Of Questions To Ask Your Doctor About Treatment May Help You Talk With Your Doctor And Learn More About Your Treatment Options.

Biomarker Testing for Cancer Treatment

Biomarker Testing May Help You and Your Doctor Choose A Cancer Treatment For You.

Types Of Cancer Treatment in Alphabetical Order

1. **Chemotherapy**

Chemotherapy Works By Killing Or Stopping The Growth Of Cancer And Other Fast-Growing Cells.

2. **Hormone Therapy**

Hormone Therapy Is A Treatment That Slows Or Stops The Growth Of Breast And Prostate Cancers That Use Hormones To Grow.

3. **Hyperthermia**

Hyperthermia Is A Type Of Treatment In Which Body Tissue Is Heated To Help Damage And Kill Cancer Cells.

4. **Immunotherapy**

Immunotherapy Is A Type Of Cancer Treatment That Helps Your Immune System Fight Cancer.

5. **Photodynamic Therapy**

Photodynamic Therapy Uses A Drug Activated By Light To Kill Cancer And Other Abnormal Cells.Doses Of Radiation To Kill Cancer Cells And Shrink Tumors.

6. **Radiation Therapy**

Radiation Therapy Is a Type Of Cancer Treatment That Uses High Doses Of Radiation To Kill Cancer Cells And Shrink Tumors

Herbal medicinal plants

s.no	plant	Family	Biological source	Active constituents	parts	uses
1	Vinca	Apocynaceae	It is obtained from the dried entire plant of ***catharanthus roseus linn***	Caharanthine, vindoline, vincristine ,vinblastin	Leaves, flowers	Lung cancer, high, testicular cancer, disinfectant[9]
2	Taxol	Taxaceae	It is obtained from the bark,leaves,roos, of the taxus species ***taxus brevifolia***	Paclitaxel	Bark, roots	Ovarian cancer, breast cancer, kaposis sarcoma
3	Anar	Punicaceae	It is obtained from the ***punica granatum***	Punicalagins, ellagicacid, anthocyanin	Fruits ,peel, seeds	Antioxidant Anti inflammator, Breastcancer, prostate,colo n cancer
4	Shisham	Fabaceae	It is obtained from the plant ***Dalbergia sisso***	Dalbergenone	Leaves	Anticancer, obesity, non healing wounds
5	Astragalus	Leguminous	Dried root of ***Astragalus membranacus***	Astragalositus ,Flavanoids	Roots[10]	Immunsysem Suppoter, Lung cancer, Liver cancer
6	Gingko	Ginkgoaceae	It is obtained from the dried leaves of plant ***Ginkgo bioloba***	Bilobalide Terpenoids	Leaves	Memory improvemen, respiratoyr issue,anicanc er
7	Ginseng	Araliaceae	It is obtained from dried root of ***Panar Ginseng***	Gingosides,gi ntonin	Roots	Immune sysem modulaor,s
8	Pine Apple	Bromeliaceae	It is obtained from the plant ***Ananas comasus***	Bromelain	Fruit	Tongue cancer [11,12]
9	Amla	Phyllanthacea e	It is obtained from the plant ***Emblica offinalis***	Emblicanin,q uercein	Fruit	Breast,uterus, pancreas,sto mach cancer
10	Ginger	Zingiberaceae	It is obtained from the plant ***Zingiber officinale***	Gingerols,Zin gerone	Rhizom es	Ovarian,colo n,breast cancer,Aniox idan
11	Ashwagan dha	Solanaceae	It is obtained from the	Withanolides	Roos,B erries	Breast,lung,c olon cancer,

			Withania Somnifera			
12	Neem	Meliaceae	It is obtained from the ***Azadirachta indica***	Azadirachtin, Nimbin,Nimbidin	Leaves, Bark	Anti inflammatory ,Antioxidans, Anticancer
13	Curcumin	Zingiberaceae	It is obtained from the ***plant Curcuma Longa***	curcumin	Rhizome	Anticancer,Antioxidant
14	Tulsi	Lamiaceae	It is obtained from ***ocium basilicum***	ocimumcin	Leaves	Antioxidant,anticancer [13]
15	Colchicine	Colchicaceae	It is obtained from the plant Colchicum Autumnale	colchicin	bulbs	Antigout.Anti cancer
16	Digitalis	Scrophulariaceae	It is obtained from the plant ***Digitalis purpurea***	Purpurea glycosides A,B,C	leaves	Anticancer drugs[14]
17	Garlic	.Liliaceae	The leaves and cloves having medicinal importance are obtained from A. ***sativum.***	allicin, allin, diallyl sulfide, diallyl disulfide, diallyl trisulfide, ajoene, and S-allyl-cysteine	bulb	Directly inhibit the growth of cancer cells[15]
18	Alovera	Liliaceae	Aloe is the fresh latex of leaves of Aloe ***Barbadenis Miller.***	anthraquinone i glycoside like barbaloin (aloe-emodin , Chrysophanic acid, B-barbaloin and Iso-barbaloin.	plant	Human bladder cancer[16]
19	Beetroot	Amaranthaceae	It consists of fresh roots of ***Beta vulgaris.***	betacyanins and betaxanthins), flavonoids, polyphenols, Saponins	Root	Breast cancer
20	Liquorice	Fabaceae	Liquorice consists of peeled and unpeeled roots, stem of ***Glycyrrhiza glabra Linn.***	Liquiritin and isoliquiritin	Root	Liquorice and its derivatives may protect against carcinogen-induced DNA damage [17]

21	Red clover	Fabaceae	It is a herbaceous species of flowering plant of ***Trifolium Pratense***	Coumarins, Saponins, Isoflavones.	Flowers and leaves	Breast cancer
22	Changa mushroom	Hymenochaetaceae	It grows on Birch trees throughout the northern hemisphere. It often resembles a dark clump of dirt but has bright orange tissue beneath its exterior.	Inotodiol, Betulin, Betulinic acid, Trametenolic acid, Melanin, Flavan, Beta-glucan, Lanosterol.	Fruiting body	Anti tumor and cervical effect[18]
23	Cherry tomato	Solanaceae	Cytotoxicity effect is effect is found in leaves of Lycopersicum esculentum.	lycopene, α, and β carotene), Vitamins (ascorbic acid and vitamin A) and glycoalkaloids (Tomatine)	Fruits	Used in the cancer cell line theraphy of breast cancer
24	Saffron	Iridaceae	Saffron is dried stigma and styletops of Crocus sativus Linn.	crocetin, gentibiose, α and β carotenes, crocin-II, lycopenea and zeaxanthin	stigmas	Anti tumor agent and skin cancer,[19,20,21, 22,23]
25	Grapes	Vitaceae	It is fresh fruit obtained from the Vitis vinifera.	tartaric malic succinic, citric and oxalic acid.	Peel and seeds	The fruits are vitaminics, tonics, anti-cancer, and hepatoprotective, promote hair growth
26	Tinospora cordifolia	Menispermaceae	Tinospora cordifolia, commonly known as Guduchi, is a climbing shrub	berberine, palmatine, and jatrorrhizine	Sherb ,stem	Immunomodulator, anti oxidant
27	Green tea	Theaceae	Green tea's biological source is the leaves of the Camellia sinensis plant	Epigallocatechin-3-gallate	Root,,steem	Inhibition of cancer cell growth[24]
28	Yew tre	Taxaceae.	The yew tree's biological source	Paxitaxel	Bark	Ovarian cancer, breast

			is Taxus brevifolia			cancer, lung cancer,[25,26,27]
29	Sweet wormwood	Asteraceae.	Sweet wormwood's biological source is Artemisia annua	Artimisin	Leaves flowers	Artemisinin may interact with iron within cancer cells, leading to the formation of free radicals that can damage and kill those cells.[28,29]
3o	May apple	Berberidaceae.	Mayapple's biological source is the rhizome and roots of Podophyllum peltatum	Podophyllotoxin	Rhizome roots	Lung cancer and teaticular cancer
31	Rosemarry	Lamiaceae.	Rosemary's biological source is Rosmarinus officinalis	Carsonic and rosemarinic	Leaves	Inhibition of cancer cell proliferation, Antioxidant activity
32	celery	Apiaceae	Celery's biological source is Apium graveolent	Apigenin,coumarins	Whole plant	Apotosis induction ,Anti inflammatory
33	Tomato	Solanaceae	The tomato's biological source is Solanum lycopersicum	Lycopene	Whole tomato ,fruit	Prostate cancer
34	Fenugreek	Fabaceae	Fenugreek's biological source is Trigonella foenum-graecum	berbamine, chelidonic acid, oxycanthine and palmatine	Seeds ,leaves	Hormone related cancers[30]
35	Barberry	Berberidaceae.	Barberry's biological source is various species within the Berberis genus, particularly Berberis vulgaris	Berberin	Roots, rhizomes	Anticancer effect,[31,32]
36	Blue berries	Ericaceae.	Blueberries belong to the genus Vaccinium	Anthocyanin	Fruit	Antioxidant,inhibition of cancer cell growth
37	Happy tree	Nyssaceae	The happy tree's biological source	Camptothecin	Bark,stem	Colon cancer,lung

			is Camptotheca acuminata			cancer,ovarian cancer
38	Broccoli	Brassicaceae	Broccoli's biological source is *Brassica oleracea var*. italica,	Sulforaphane	Florets and stems	Prostate cancer,breast cancer
39	Reishi Mushroom	Ganodermataceae.	The reishi mushroom's biological source is primarily *Ganoderma lucidum*	Ganoderic Acids	Fruiting body and seedling	Potential anticancer effect
40	Cat's Claw	Rubaceae	It is obtained from the plant woody *Uncaria tomentosa*.	Triterpenes,Alkloids	Root and bark	Immunomodulation

1]Vinca

2] 2Taxol

3]Anar

4] Shisham

5] Astragalus

6] Gingko

7] Ginseng

8] Pineapple

9] Amla

10] Ginger

11] Ashwagandha

12] Neem

13] Curcumin

14] Tulsi

15] Colchicines

16] Digitalis

17] Garlic

18] Alovera

19] Beetroot

20] Liquorice

21] Red Clover

22] Changra Mushroom

23]Cherry Tamato

24] Saffron

25] Grapes

26] Tinosporsa Cordifolia

27]Yew Tre

28] Green Tea

29] Sweet worm Wood

30] May Apple

31] Rosemary

32] Celery

33] Tamato

34] Fenugreek

35]Barberry

36] Blue Berries

37]Happy Tree

38] Broccolli

39] Reishimushroom

40] Cats Claw

Conclusion:

From the present review, it can be concluded that herbal medicinal plants and their derivatives are active against various type of cancers like lymphomas, breast, ovarian, lung, liver, stomach, prostate and testicular cancers. In conclusion this article provides the knowledge about anticancer medicinal plants of foreign origin, which are used by people all over the world. Also. The cheap herbal medicinal treatment which may highly be recommended to the rural and poor people especially of developing countries to treat effectively the cancers of different type is an ideal choice. The investigated traditional medicinal plants in this article could be a key to identify the compounds with anti-cancer effects. it is of significance to exploit novel anticancer drugs from medicinal plants therefore, if their compounds are examined, they might help to develop new, more efficient drugs, in addition to contributing to identify the main mechanisms involved in cancer. .

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