A REVIEW ON HERBS USED IN CANCER

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ABSTRACT:

Medicinal plants are significant source of anticancer drugs. To name a few Taxol and Vinca alkaloids are counted among the best anticancer drugs. According to one estimate, more than 700 mono and poly-herbal preparations are available in the form of decoction, tincture, tablets and capsules from more than 100 plants are in clinical use. Herbs along with a large number of Pharmacological properties also possess anticancer activities. The following study tried to summarize the common herbs which have been found to posses anti cancer activity.

KEY WORDS: Cancer, Cytotoxic, Anticancer, Herbal Medicines.

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INTRODUCTION

Many voyagers, including the legendary Christopher Columbus, explored the seas in search of treasured spices. These valued commodities contribute not only flavors but also serve as colorants and preservatives in a wide variety of cultures. Today, spices are increasingly revered not only for their culinary properties but also for their potential health benefits. Although the health attributes associated with spice use may arise from their antioxidant properties, their biological effects may arise from their ability to induce changes in a number of cellular processes, including those involved with drug metabolism, cell division, apoptosis, differentiation, and immune competence.

Unknown to many, Nature has provided us with some useful herbs for cancer, which is one of the most prevalent and frightening diseases in today's society.Nothing strikes dread into the heart of a patient quite like the word cancer. Due tothe medicalindustry, cancer has been built up and portrayed as a disease that only medicaltreatmentshave any real chance of beating.However, an herbalcancer treatmentusing the right herbs not only match, but vastly exceed all medicaltreatmentsin terms of cancer fighting ability. In fact, the statistics for conventionalcancer treatmentis utterly dismal.

To effectively fight cancer, we have to understand its origin. Cancer is not a disease that a person simply 'gets'. Cancer is a disease that sets foot in a body that has degenerated to such a low point that it can no longer expel cancerous cells from itself. Most people get cancer over a period of 5, 10, 20, or 30 years.

Cancer is a whole-body disease. Thus, to beat cancer, we have to use a broad spectrum, whole-body approach. While there have been people who have recovered using herbs for cancer, the use of an herbal treatment for cancer is only one part of this total protocol and its results will be limited when used in isolation.

If one travels through the decades of scientific research, one would realize that there are literally hundreds of different plants which have been proven in laboratory trialsto haveanti-cancer effects, and thus would be useful in some way as cancer herbs to fight the disease.

However, herbs do not cure cancer per se - no cancer herb can "cure" the disease. In fact, nothing external can cure cancer, or any disease in the body for that matter; only the body can ultimately heal itself, when it is given the right environment and support to do so. Thus, the use of herbs for cancer, or for any disease, must be taken in the right context.

PLANT PROFILE

APRICOT[1,2]**:**

COMMON NAME: Albaricoque, Damasco, Siberian apricot, Apricock, jardalu.

BIOLOGICAL SOURCE :It obtained from the ripped fruit of the plant *Prunus armeniac* belonging to the familyRosaceae .

CHEMICAL CONSTITUENT :The fresh apricot fruit contains carbohydrates, vitamins C and K, betacarotene, thiamine, niacin, and iron. Organic acids, phenols, volatile compounds (eg, benzaldehyde), some esters, norisoprenoids, vitamin B-17 and terpenoids also have been isolated.

Apricot kernels contain the cyanogenic glycoside amygdalin. Amygdalin can be hydrolyzed to form glucose, benzaldehyde, and hydrocyanic acid. Enzymatic release of cyanide occurs in the presence of beta-glucuronidase, an enzyme found in the human intestine.

Laetrile is often used interchangeably with amygdalin, but they are not the same chemical entity. The term laetrile is an acronym from laevorotatory and mandelonitrile, used to describe a purified form of amygdalin.

MECHANISM OF ACTION :The mechanism of action is unknown .Claims for amygdalin's activity rely on the theory, now proven false, the cancer cell contain elevated amount of β-glucosidase and reduced level of rhodanese compared with normal cell. Based on this incorrect assumption, cancer cell were claimed to metabolise amygdalin into cyanide and die, whereas healthy cell would convert cyanide to benign thiocyanate via rhodanese. Limited in vitro data support the idea that cyanide, benzaldehyde and prunasin are cytotoxic. It has been postulated that cancer develops owing to deficiencies of vitamin B-17, but no data substantiate this idea.

USES: Cancer prevention and cancer treatment, asthma, cough, constipation, bleeding, infertility, eye inflammation, spasm, and vaginal infections.

BITTER MELON [1, 3]**:**

COMMON NAME: Bitter gourd, Bitter squash, Wild cucumber, Kerala.

BIOLOGICAL SOURCE: It is obtained from the fruit of the plant *Momordica charantia* belonging to the family cucurbitaceae.

CHEMICAL CONSTITUENT: Glycosides: momordin, charantin; Alkaloids: momordicin; others: polypeptide P; oils (seed only): stearic, linolieic, oleic acids; glycoprotein: α-momorcharin, β-momorcharin, lectins; others: vicine (pyrimidine nucleoside) protein MAP30.

MECHANISM OF ACTION: Vicine, chaantin and polypeptide P in both animals and human increase glucose uptake and glycogen synthesis in the liver, muscle and adipose tissue and improve glucose tolerance. Study with hepatic enzymes in mice revealed reduction in glucose-6-phosphatase and fructose-1,6-biphosphatase activity and increased glucose oxidation by the glucose-6-phosphatase dehydrogenase pathway. Bitter lemon displays cytotoxic activity against leukemic cell in vitro (guanyl atecyclase inhibitor). The MAP30 extract has a cytostatic effect on MDA-MB-231 human breast cancer cell xenografted into mice. MAP30 also demonstrate dose-dependent inhibition of HIV-I integrase leading to poor viral deoxyribonucleic acid (DNA) integration, thus inhibiting T lymphocytes and monocytes.

USES: Cancer prevention and cancer treatment, stomach and intestinal disorders including gastrointestinal (GI) upset ulcers, colitis, constipation, and intestinal worms. It is also used for diabetes, kidney stones, fever, a skin condition called psoriasis and liver disease; to start menstruation; and as supportive treatment for people with HIV/AIDS.

CASCARA[1,4,5]

COMMON NAME: Bitter bark, buckthorn, cascararinde, cascara sagrada, chittem bark, Cortex rhamnipurshianae, purshiana bark, Rhamnus, and sacrbark.

BIOLOGICAL SOURCE: It is obtaining from the dried bark of the plant *Rhamnus purshiana* belonging to the family Rhamnaceae

CHEMICAL CONSTITUENT: Anthracene glycosides: cascarosides, aloins, chrysaloins, aloe-emodin, chrysophenol, emodin, physcion; others: linoleic acid myristic acid, syringic acid, lipids, resin, tannins.

MECHANISM OF ACTION: Cascara's anticancer activities may rise from its emodin and aloe-emodin content. In vitro studies show that aloe-emodin induces p53 and p21 expression which results in cell cycle arrest in the G1 phase. However, more studies are needed to confirm this effect. Studies on the carcinogenic effect of cascara have produced conflicting result.

USES: Cancer prevention and cancer treatment.

GINSENG (AMERICAN) [1, 6]

COMMON NAME: Xi yang shen, Tienchi ginseng, Western ginseng, five-fingers.

BIOLOGICAL SOURCE: It obtained from the root of the plant *Panax quinquefolius* belonging to the family Araliaceae.

CHEMICAL CONSTITUENT: Saponin glycosides: panaquilon, ginsenosides; volatile oils; antioxidants; polysaccharides; fatty acids; vitamins; polyacetylenes.

MECHANISM OF ACTION: Related species such as *Panax ginseng* have been the focus of most laboratory and clinical research. Experiments using extracts from these species indicate that ginsenosides stimulate and inhibit the CNS. The extracts stimulate tumor necrosis factor-α production by alveolar macrophages. The Rg1 ginsenoside is associated with improvement in humoral and cell-mediated immune response and increases in T helper cells, T lymphocytes and natural killer cells in mice. Anticancer activity has been shown in vitro for several ginsenosides.

USES: Cancer prevention, cancer treatment, diabetes, health maintenance, immunostimulation, strength and stamina.

TURMERIC [1, 5]

COMMON NAME: Haldi, curcumin, gianghuang.

BIOLOGICAL SOURCE: It obtained from the rhizome of the plant *Curcuma longa* belonging to the family Zingiberaceae.

CHEMICAL CONSTITUENT**:** It contains volatile oil mainly sesquiterpenes and zingiberene and curcumin; electrolyte potassium; vitamin ascorbic acid, carotine; polysaccharides.

MECHANISM OF ACTION: In vitro and animal models of breast cancer show that turmeric may inhibit chemotherapy- induced apoptosis via inhibition of the JNK pathway and reactive oxygen species generation. Curcumin has displayed antitumor activity and may be protective against some cancer, such as colon cancer. In laboratory tests, curcumins' antitumor actions appear to be attributable to interaction with arachidonate metabolism and its in-vivo anti angiogenic properties.

USES: Cancer prevention, cancer treatment, infections, inflammation, kidney stones, stomach and intestinal gas.

MAITAKE [1, 7]

COMMON NAME: King of mushroom, dancing mushroom, cloud mushroom, hen of woods.

BIOLOGICAL SOURCE: It obtained from the polypore mushroom *Grifola frondosa* belonging to the family Meripilaceae.

CHEMICAL CONSTITUENT: Polysaccharides: 1,3-and 1,6-β-glucan appears to be the most active ingredient; α-glucane is also present; lipids: octadecanoic and octadecadienoic acids; phospholipids: phosphatidyl-ethanolamine, phosphatidylcholine, phosphatidylinositol, phosphatidylserine, phosphatidic acid; argosterol.

MECHANISM OF ACTION: Maitake is thought to exert its effect through its ability to activate various effector cells, such as macrophages, natural killer cells, T cells, interlinking-1 and superoxide anions, all of which had anti cancer activity.

USES: Cancer prevention and cancer treatment, diabetes, high cholesterol, hypertension, immuno stimulation, weight loss.

CUMIN [8, 9]

COMMON NAME: Jiraka, Jira

BIOLOGICAL SOURCE: It obtained from flowering parts of *Cuminum cyminum* plant belonging in the family Apiaceae

CHEMICAL CONSTITUENT: It contains thymoquinone (TQ), volatile oil mainly of 30-50% cumin-alde hyde , small parts of pinene, phellandrene, cuminic alcohol, hydro cuminine.

MECHANISM OF ACTION: Several mechanisms may explain the ability of TQ to bring about a change in cell division in neoplastic cells, including down-regulation in Bcl-xL, cyclin D1, and VEGF. Considerable evidence points to the ability of TQ to induce free radical formation in tumor cells.

USES :cancer prevention and cancer treatment, it suppresses tumor cell proliferation, including colorectal carcinoma, breast adeno carcinoma, osteosarcoma, ovarian carcinoma, myeloblastic leukemia, and pancreatic carcinoma.Antioxidant, antimicrobial, anti-inflammatory, and chemo-preventive properties and to ameliorate B(*a*)P-induced carcinogenesis in the fore-stomach..

GARLIC [10, 11]

COMMON NAME: Lahasun, Rasun, Skordo, Vellulli.

BIOLOGICAL SOURCE: It obtained from the bulb of the plant *Allium sativum* belonging to the family Alliaceae

CHEMICAL CONSTITUENT : Allicin, phytoncide, sulfur-containing compounds alliin, ajoene, diallyl polysulfides, vinyl dithiins, *S*-allyl cysteine, and enzymes, B vitamins, proteins, minerals, saponins, flavonoids, and Maillard reaction products, which are not sulfur-containing compounds. Furthermore, a phytoalexin (allixin) was found, a non sulfur compound with a γ-pyrone skeleton structure.

MECHANISM OF ACTION: Allixin showed an antitumor promoting effect in vivo, inhibiting skin tumor formation by TPA and DMBA initiated mice. Analogs of this compound have exhibited antitumor promoting effects in *in vitro* experimental conditions. So allixin and/or its analogs may be useful compounds for cancer prevention. Suppression of nitrosamine formation continues to surface as one of the most likely mechanisms by which garlic retards cancer. The ability of S-allyl cysteine (SAC) and its nonallyl analog S-propyl cysteine to retard N-nitroso compounds formation, but not diallyl disulfide (DADS), dipropyl disulfide, and diallyl sulfide (DAS), reveal the critical role that the cysteine residue plays in inhibition. Allyl sulfur compounds preferentially suppress neoplastic over non-neoplastic cells.

USES: Cancer prevention and cancer treatment, itcan lower the incidence of breast, colon, skin, uterine, esophagus, and lung cancers. It has been found to reduce platelet aggregation and hyperlipidemia. It may have other beneficial properties, such as preventing and fighting the common cold. Garlic is also alleged to help regulate blood sugar levels.

SAFFRON [12, 13]

COMMON NAME: Fan honghua, Safran, za'faran

BIOLOGICAL SOURCE: It is obtained from the flower tops of the plant *Crocus sativus* belonging to family Iridaceae.

CHEMICAL CONSTITUENT: Saffron likely contains more than 150 volatile and aroma-yielding compounds, in which the major one is safranol. A carotenoid, α-crocin, comprises more than 10% of dry saffron's mass and is responsible for the rich golden-yellow hue created when saffron is added to food dishes. Picrocrocin, a bitter glucoside, is responsible for saffron's flavor.

MECHANISM OF ACTION: Changes in carcinogen bioactivation and tumor proliferation appear to occur. Crocin and dimethyl-crocetin exhibit potent cytotoxic effects on human cancer cells by disrupting DNA-protein interaction, a step important for cellular DNA synthesis of cancer cells and prolonging the survival time of cancer-bearing animals. In addition they have a chemoprotective effect against carcinogenic agents and undesired toxicity induced by cyclophosphamide. Crocetin is a potent selective inhibitor of hepatic cAMP-dependent protein kinase. It inhibits DNA , RNA synthesis in isolated cell nuclei and suppresses the activity of purified RNA polymerase II. The mechanism by which saffron suppresses tumor proliferation has not been adequately explored, but a shift in caspases and an increase in Bax protein are possible. The effects of tumor suppression also have an impact on the longevity of the host.

USES : Cancer prevention and cancer treatment ,aqueous saffron preparations have been reported to inhibit chemically induced skin carcinogenesis. Saffron and crocus also have significant anti tumerogenic properties.

CAMPTOTHEC[14,15,16]

COMMON NAME :Happy tree, cancer tree, tree of life.

BIOLOGICAL SOURCE :It obtained from the fruit of *Camptotheca acuminate* belonging to the family Nyssaceae.

CHEMICAL CONSTITUENT: The fruit contains camptothecine, hydroxyl camptothecine, methoxyl camptothecine and venoterpine

MECHANISM OF ACTION: Camptothecine is a S-phase specific anticancer agent. It induces a significant dose dependent apoptosis of human leukemic cells and neuronal cells. Camptothecine and methyl camptothecine have been found to inhibit the growth of L-1210, P-388, L-5178, and YK-1864 leukemia cells, Ehrlich cells ascites cells. Camptothecine displays a unique mechanism of action to inhibit topoisomerase I (top1) involved in in DNA replication. It has a synergistic effect with 5-fluorouracil(5FU) and cisplatin by increasing DNA interstand cross-links on cancer cells. It also can enhance the anti-cancer effect of radiotherapy against melanoma and colorectal adenocarcinoma.

USES : Cancer prevention and cancer treatment ,it used to treat solid cancer including breast cancer, carcinoma of stomach, rectum, colon, and bladder as well as chronic leukemia.

CEPHALOTAXUS [17]

COMMON NAME: Chinese Plum Yew, Plum Yew, Chinese Cowtail Pine.

BIOLOGICAL SOURCE: They are obtained from the branch of a coniferous shrub or small tree *Cephalotaxus fortune* belonging to the family Cephalotaxaceae.

CHEMICAL CONSTITUENT: It consists of the alkaloids cephalotaxine, epicephalo taxine, demethyl cephalotaxine, and cephalotaxinone. *C. harringtonia* contains harringtonine, homooharringtonine, isoharringtonine, deoxyharringtonine.

MECHANISM OF ACTION : The alkaloids markedly inhibited the growth of sarcoma cells and leukemia cells. The action was non selective and that herb universally inhibited the G1, G2, and S stages of cell division. Mitosis of cancer cells are greatly reduced. The compounds of harrintonine group can inhibit the homopoietic system and reduce leukocyte count, thus effective in treatment of granulocytic leukemia, chronic granulocytic leukemia, and mononuclear leukemia. It significantly inhibits cell growth and protein and DNA synthesis. It can cause chromosomal aberrations and induce morphological transformations.

USES: Cancer prevention and cancer treatment, it is used to treat malignant tumors, such as malignant lymphoma, and the various types' leukemia.

DISCUSSION

It is important to note that, the herbs for cancer discussed above are some of the most powerful herbs known to fight cancer. Some of them are herbs that destroy cancer cells; some help to clean up or strengthen the body; some do both. Many people in conventional medicine, researchers and doctors are just ignorant of the possibilities of natural health alternatives / natural health and healing. They have been schooled in allopathic medicine, which is extremely different in its operating philosophy. Conventional medicine repairs, fixes, cuts, removes, covers and masks symptoms; it does not deal with the root causes of diseases, nor does it aid the body in healing itself, in carrying out ultimate healing. These people only read mainstream medical journals and materials, which of course protect their vested interests, and only talk about their own methods, such as chemical drugs. Through this study we have tried to highlight the gifts that nature has given us to fight against cancer, but this will need much efforts from all quarters, like researchers, practitioners, patients to bring them in mainstream medicine.

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