



A review on herbal drug phytoconstituent used for treatment of cancer

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Abstract

Cancer is one in every of the leading and most fatal diseases within the gift decade, per annum lots of individuals die due to varied styles of cancers. Several aspects relate to the reason for UN wellness besides heredity, food habits, smoking, organic process behaviors, radiation etc. The made cancer medical care until currently has been beneath analysis, solely therapy and radiation treatments are occasionally made and far times venomous and fatal. Various and fewer venomous medication is extremely abundant in would like towards the UN wellness, the employment of ideas of seasonal medication with information of Ayurveda may gift higher drug leads towards the repressive treatment of Cancer. Nature shows embarrassment of healthful plants with antineoplastic and inhibitor activities which can suppress the UN wellness fully. The explore for cancer medication from natural sources started in late Nineteen Sixties, cause discoveries of periwinkle plant derivative, periwinkle plant derivative, camptothecin and taxol. This review definitely focuses on the seasonal medication from natural merchandise for the invention of recent drug leads towards the cancer treatment.

Keywords: ayurveda, cancer, therapy, seasonal medication, potent compounds (secondary metabolites)

Introduction

Natural merchandise particularly plants are used for the treatment of varied diseases promisingly from the decades by information of Ayurveda in our country. In developing countries seasoner medication is that the supply of recent discoveries for the new drug leads towards varied tending problems and synthesis of recent formulations. Ancient medication in comparison to different sources of drug discoveries had contributed several novel therapeutic compounds for preventive and curative medication. Secondary metabolites like polyphenols, terpenes and alkaloids are reportable to possess anti mutagenic and antineoplastic properties in several studies. many researches on cancer medication and discovery of recent lead molecules towards anti neoplastic activity by exploitation healthful plants was advises, reason to explain- as healthful plants are reservoirs of antioxidants and possess no toxicity as compared to the trendy drugs; thought of mixing Ayurveda with advanced drug discovery could bring some lead compounds towards varied human sufferings.

Natural lead molecules towards treatment of Cancer

Cancer is one in every of the foremost life threatening diseases and possess several jeopardy in each developed and developing countries, characterized by irregular proliferation of cells. Each biological modification is often seen once a traditional cell progresses to cancerous one. Since several treatments are obtainable for cancer medical care still cancer is that the ordinal leading reason for death within the globe, therapy and trendy medication for treatment of cancer reportable a lot of facet effects within the patients treated. Every year, lots of individual's are diagnosed with cancer,

resulting in death. Cancer kills regarding 3500 million individuals annually everywhere the world; it accounts over 2-3% of the annual deaths recorded worldwide. Treatment of Cancer is somewhat made with chemo preventive agents however usage is left against risk due to their toxicity. Smoking, dietary imbalances, hormones and chronic infections resulting in chronic inflammation accounts high casuals for cancer unwellness. In sight of great facet effects of chemotherapy and radiation treatment for cancer, there ought to be immediate explore for various and safer ways of treatment. As age previous language invariably bar is best than cure, cancers are often preventive by correct dietary habits, language no to tobacco, treatment of inflammatory diseases effectively, and taking organic process supplements that aid immune functions. Therapy, presently the sole major Treatment modality used for the management of advanced Stages of malignancies, exhibits severe toxicity on traditional tissues. The explore for cancer medication from natural sources started with discovery of Podophyllotoxin in late Nineteen Sixties, any cause discoveries of periwinkle plant derivative, periwinkle plant derivative, camptothecin and taxol. Nature counts over one thousand species of plant varieties that possess important anti-cancer properties. Taxol, one in every of the foremost outstanding agents, has been found useful in treatment of refractory sex gland, breast and different cancers, Podophyllotoxin, artificial modification of this molecule diode to the event of Etoposide, famous to be effective for little cell cancers, of the lungs and testes. The invention of medicinally vital herbs and their mechanism of action would offer another and effective treatment towards the cancer bar. Since decade's embarrassment of medicine are developed from potent compounds that are isolated from

healthful plants. The method of drug discovery and development includes 3 main following analysis approaches

1. Bioactivity: supported mechanism of specific action-directed isolation and characterization of active compounds,
2. Rational drug style: involves modification and synthesis of analog, and
3. Mechanism of action studies.

Traditional medication and information of Ayurveda facilitate within the discovery of recent drug leads with high activity and low toxicity for cancer medical care, initial analysis focuses on the isolation of bioactive lead compounds, chemical modification and up different medicine profiles. The employment of ancient medication for treatment of varied diseases is sustained within the Indian sub-continent with greater biological science diversity. Ethno historical accounts shows that healthful plants are used as a remedy for varied human ailments, the explanation of exploitation these plants is that they're reservoirs of potent chemical compounds that acts as a curative medication with fewer facet effects. Over the past decade, tending system is all round the seasonal medication and gained international importance, creating an impression on each world health and international trade. Because of the low economic rate of the bulk of population in developing countries and high value of Western medication, seasonal medication features a long and uninterrupted history of continuous usage by an outsized proportion of the population within the developing countries. Additionally from their cultural and religious points seasonal medicines are a lot of acceptable in these countries. Cancer would be most likely the foremost vital genetic disorder to hold out treatment with healthful plants.

Example

Plant-derived clinically used anticancer agents: 1. Vinblastine, 2. Vincristine, 3. Etoposide, 4. Teniposide, 5. Taxol, 6. Docetaxel, 7. Topotecan, 8. Irinotecan Microtubulin assembly into coiled spiral aggregates induced by self-association of tubulin is under the influence and mode of action of Vincristine.

Etoposide is a topoisomerase II inhibitor causes DNA breaks, whereas topoisomerase I is inhibited by the action of Docetaxel. Drugs made of synthetic chemistry and use of technological combinatorial chemistry in the synthesis of new leads, still today drugs derived from natural product make an enormous contribution to drug discovery. Nature is an attractive source of new therapeutic candidate compounds as a tremendous chemical diversity is found in millions of species of plants, several plant derived compounds are currently successfully employed in cancer treatment.

Plants Used for Cancer Treatment

The annual deaths across the globe according to American cancer society accounts for more than 3 million cancer deaths, ongoing research is being done throughout the world to seek out effective treatments for cancer, Chemotherapy which includes the high risk dosage of chemical drugs leading to high toxic cases at times.

Medicinal plants relieve and treat cancer by making use of the compounds naturally present with antioxidant, anticancer activities that are known to inhibit or kill carcinogenic cells, some plants may contain properties that naturally have the ability to prevent the spread or risk of developing various forms of cancer. Some examples of plants that may be used for cancer treatment are discussed with their respective advancements are listed in below Table No. 2.

Table 1: Some examples of secondary metabolites having ant cancerous activity

Drug	Medical use	Mechanism of action
Vinblastine	Breast, lymphoma, germ-cell and renal cancer	Inhibits cell proliferation by acts as mitotic block
Vincristine	Leukemia, lymphoma, breast, lung, pediatric solid cancers and others	Inhibits cell proliferation by acts as mitotic block
Taxol	Anticancer agent	Antimitotic agent
Docetaxel	Breast and lung cancer	Prevents mitosis by binding to microtubules
Topotecan	Ovarian, lung and pediatric cancer	Through inhibition of DNA topoisomerase I
Irinotecan	Colorectal and lung cancer	Through inhibition of DNA topoisomerase I

Table 2

Plant name	Species name	Common name	Compound name	Mechanism of action
Autumn Crocus	Colchicum Autumnale	Naked Ladies, Colchicum, and Meadow Saffron	Colchicine	It is used to treat inflammatory disorders. It is also valued for its chemotherapeutic properties
Birch	Betula Alba	Birch	Betulinic Acid	Effective in the treatment of prostate cancer patients.
Camptotheca	Camptotheca Acuminata	Xi Shu, Happy Tree	Camptothecia, Topotecan, CPT-11, 9- Aminocamptothecin	It is used as drugs for cancer treatment.
Docetaxel	Taxus Baccata	Yew	Docetaxel, Taxol	Breast and lung cancer
Hemp	Cannabis Sativa	Marijuana, Bhang, Ganja, and Hashish	Delta-9- Tetrahydrocannabinol	Widely used as a drug, commonly known as marijuana. In many countries regulatory limits for concentrations of psychoactive drug compounds.
Lapacho Tree	Tabebuia Impetiginosa, T. Avellanadae	Lapacho, Pau D'Arco, Tahebo, and Ipe Roxo	Beta-Lapachone, Lapachol	It is promoted as a treatment for a number of human ailments, including cancer.
Mayapple	Podophyllum	Devil's Apple, Hog	Podophyllotoxin, Etoposide,	Treat both lung and testicular cancer.

	Peltatum	Apple, Indian Apple, Umbrella Plant	Podophyllinic Acid, and Teniposide	
Nothapodytes Tree	Nothapodytes Foetida	Nothapodytes Tree	Acetylcamptothecin, Camptothecin, Scopolectin.	This tree is used to make the antileukaemia and antitumoral
Pacific Yew	Taxus Brevifolia	Yew	Paclitaxel	Treatment of refractory

Ayurvedic Concept of Cancer

Cancer described as “*granthi*” and “*arbuda*” in Charaka and Sushruta Samhita by two great Indians and explained the disease conditions reasons responsible behind the cause of cancer. Charaka and Sushruta explained cancer as inflammatory or devoid of inflammation, based on the doshas involved. Three doshas “*Vata, Pitta and Kapha*” in body are responsible for disease and the balanced coordination of these doshas in body, mind and consciousness is the definition of health in Ayurveda. A morbid condition arises in cancer is the state where all three major body humors lose mutual coordination and it is explained as *Tridoshicarbudas* in Ayurveda. In ayurveda the concept of Neoplasm shows various clinical symptoms. *varous types of cancers were much earlier classified in to three groups in ayurveda. The three groups divided in ayurveda based on their occurance.*

Group I: malignancies which includes sarcomas, leukaemia, oral cancer, and incurable or malignant ulcers.

Group II: Inflammatory conditions that can be altered to a probable malignancies, such as ulcers and growths under certain influences like radiation, change in dietary habits, stress, smoking etc. Examples of these are growth of lips, incurable thyroid tumour, abdominal tumours like carcinomas of the stomach and liver or lymphomas.

Group III: Diseases in which there is a possibility of malignancy, such as incurable jaundice, intreatable sinusitis.

Conclusion

Medicinal plants are rich sources of herbal properties contributing in the discovery of new drugs towards various disorders, diseases including cancer without showing no toxic affects on the individuals treated. Treatment of cancer by use of natural products and traditional medicine by applying the concepts of Ayurveda is attaining a great significance scope of cancer research. In this review author presented the importance of traditional medicine, medicinal plants in cancer treatment, Anti-Cancer properties of natural products in brief. Medicinal plants contain good immunomodulatory and antioxidant properties which leads them to be a anticancer drug. Only few selected plants have been explored for biological activity from around 1000 species and much more, so further investigations into anticancer activity of the plants showing promising activity, must be undertaken. *Vinca rosea* alkaloids, Vinblastine and Vincristine, are one of the most potent anticancer drugs known. Taxol isolated from *Taxus brevifolia* has figured high in the therapeutic segment of cancer. From this review, it can be concluded that cancer is the leading cause of death in developing countries like India. The less expensive herbal drug treatment may highly be recommended to the rural and poor people to treat

effectively the cancers of various type is an ideal choice.

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