ANTI CANCER PROPERTY OF PLANT PRODUCTS
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ABSTRACT
Plants as well as plant derived compounds have played significant role in the development of a number of clinically used anti-cancer agents. These include vinblastine, vincristine, the camptothecin derivatives, topotecan and irinotecan, etoposide, derived from epipodophyllotoxin, and paclitaxel. Quite a lot of promising new agents are in clinical development based on selective activity against cancer-related molecular targets, including flavopiridol and combretastin A4 phosphate, and some agents which failed in earlier clinical studies are stimulating renewed interest. Also there are some of the semi synthetic plant derivatives which are clinically used as potential anti cancer agents. The traditional and the preliminary scientific work on these plant products are giving promising results, further research in the same is to be continued to derive potent anti cancer agents from medicinal plants.

KEYWORDS: Cancer, Plant products, Etoposide, Teniposide, Podophyllotoxin

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INTRODUCTION
Cancer (malignant tumour) is an abnormal growth and proliferation of cells. It is a frightful disease because the patient suffers pain, disfigurement and loss of many physiological processes. Cancer may be uncontrollable and incurable, and may occur at any time at any age in any part of the body. It continues to represent the largest cause of mortality in the world and claims over 6 millions. Cancer kills annually about 3500 per million populations around the world. Although more than 1500 anticancer drugs are in active development with over 500 of the drugs under clinical trials, there is an urgent need to develop much effective and less toxic drugs. Plants have a long history of use in the treatment of cancer. Plants used against cancer lists more than 3000 species that have reportedly been used in the treatment of cancer. The focus was on the tropical and sub-tropical regions of the world, but it is interesting to note that no new plant-derived clinical anti cancer agents have, as yet, reached the stage of general use. However a number of agents are under preclinical development. Given below are some of such plants which are yielding successful results in the drug development against cancer.

LIST OF FEW OUT OF MANY IDENTIFIED PLANTS
Azadirachta indica, Camellia sinensis, Catharanthus roseus, Semecarpus anacardium, Plumbago zeylanica, Withania somnifera, Abrus precatorius, Albizia lebbeck, Asparagus racemosus, Piper betel, Anona squamosa, Boswellia serrata, Melia azadirachta

DESCRIPTION AND DETAILS
Azadirachta indica (neem tree) has been used successfully to reduce tumors by herbalists from centuries. Recent studies indicated that an ethanolic extract of neem has been shown to cause cell death of prostate cancer cells (PC-3) by inducing apoptosis as evidenced by a dose-dependent increase in DNA fragmentation and a decrease in cell viability. Different studies indicate its use against buccal carcinogenesis, skin carcinogenesis, prostate cancer, mammary carcinogenesis, gastric carcinogenesis, Ehrlich carcinoma and B16 melanoma. A. indica (Neem) has also revealed a chemo preventive capability by regressing the hepatocarcinogenesis induced by DEN/AAF carcinogens. Camellia sinensis (Tea) is one of the most popular beverages in the world. The consumption of tea has been associated with a decreased risk of developing cancers of the ovary, oral cavity, colon, stomach and prostate. This beneficial health effect has been attributed to the...
catechins (flavonoids) present in it which has strong anti-oxidant and anti-carcinogenic activity.

**Catharanthus roseus:** The first plant products to advance into clinical use are vinca alkaloids, vinblastine and vincristine extracted from Catharanthus roseus (Vinca rosea). These compounds showed significant action against Lymphatic leukemia. Nowadays these extracts are used in combination to other cancer chemotherapeutic drugs for treatment of variety of cancers.

**Semecarpus anacardium,** the marking nut contains K40. Pilot studies of the therapeutic effects by Semecarpus anacardium (SCAS) in cases of cancer showed encouraging results inviting further investigations and greater use in suitable cases of cancer i.e., hepato carcinoma, chronic myeloid leukemia and esophageal cancer.

**Plumbago zeylanica:** Aqueous, alcoholic, acid and olive oil solution of Plumbago zeylanica (0.005ml/gm.) were reported to be devoid of anti tumour action against rhabdo- myosarcoma in rats. But Plumbagin was reported to act against P388 lymphocytic leukemia.

**Withania somnifera,** a common Indian medicinal plant, may be good source of anti-tumour compound. Studies like Anticancer Properties of Highly Purified L-Asparaginase from Withania somnifera L. against Acute Lymphoblastic Leukemia also witnessed the efficacy of Aswagandha on Cancer, the Indian Ginseng.

**SEMI SYNTHETIC PLANT DERIVATIVES AGAINST CANCER**

The clinically active agents, Etoposide (VM 26) and Teniposide (VP 16-213) are semi synthetically derived from plants which are proven with excellent anticancer activity by causing DNA damage to cancer cells. These two products are designed by chemical make to plant derivative like podophyllotoxin.

CONCLUSION

Considerable works have been done on the medicinal plants to treat cancer, and many plant products are identified and are even marketed as anticancer drugs. These plants may promote host resistance against infection by re-stabilizing body equilibrium and conditioning the body tissues. The various combinations of the active components of these plants after isolation and identification can be further assessed for their synergistic effects. Preparation of standardized dose and dosage regimen may play a critical role in the remedy of cancer. Combination of different therapeutic agents are to be used for better results. There is a broad scope to derive the potent anticancer agents from medicinal plants, which need thorough research.

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