Review Article

A Study on Natural Anticancer Plants

Jitendra Jena[1]*, Rakesh Ranjan[2], Poonam Ranjan[3] and Manoj Kumar Sarangi[4]

[1,2,3]Pharmacy College, Itaura, Chandeshwar, Azamgarh, Uttar Pradesh, India.
[4]Sardar Bhagwan Singh PG Institute of Biomedical Sciences and Research, Balawala, Dehradun, India.

ABSTRACT
Life on earth is a gift from nature and plants which are inherent part of nature are a great boon to mankind. The very existence of mankind is threatened by various diseases. Man's search for health is unending quest for longer, happier & healthier life. Yet diseases & sufferings remains a point off his struggle for existence. As life is precious, it has to be protected, so in order to survive, therefore identification of medicinal plants is very necessary. These secondary metabolites of plants have been one of the important sources of medicines over since the beginning of human civilization a series at malignant disease termed as Cancer may affect different parts of the body. More than 3000 plants species that have reported to treat cancer. Therefore a review is made for the natural medicinal plant which is used in the treatment of different type of cancer.

KEYWORDS: Anti Cancer, Natural Plants, secondary metabolites.

INTRODUCTION TO CANCER

Cancer is the uncontrolled growth of abnormal cells in the body. Cancerous cells are also called malignant cells. Although cancer can develop in virtually any of the body's tissues, and each type of cancer has its unique features, the basic processes that produce cancer are quite similar in all forms of the disease. Cancer begins when a cell breaks free from the normal restraints on cell division and begins to follow its own agenda for proliferation **(Figure 1).** All of the cells produced by division of this first, ancestral cell and its progeny also display inappropriate proliferation. A tumor, or mass of cells, formed of these abnormal cells may remain within the tissue in which it originated (a condition called in situ cancer), or it may begin to invade nearby tissues (a condition called invasive cancer). An invasive tumor is said to be malignant, and cells shed into the blood or lymph from a malignant tumor are likely to establish new tumors (metastases) throughout the body. Tumors threaten an individual's life when their growth disrupts the tissues and organs needed for survival.

There are over 100 different types of cancer, and each is classified by the type of cell that is initially affected. Most can fit into the following categories according to the National Cancer Institute:

Carcinoma
Cancer that begins in the skin or in tissues that line or cover internal organs

Leukemia
Cancer that starts in blood-forming tissue such as the bone marrow and causes large numbers of abnormal blood cells to be produced and enter the blood

Lymphoma and myeloma
Cancers that begin in the cells of the immune system

Central nervous system cancers
Cancers that begin in the tissues of the brain and spinal cord

Men
Prostate, lung, and colorectal

Women
Breast, colorectal, and lung

Children
Leukemia, brain tumors, and lymphoma

More dangerous, or malignant, tumors form when two things occur:

- A cancerous cell manages to move throughout the body using the blood or lymph systems, destroying healthy tissue in a process called invasion.
- That cell manages to divide and grow, making new blood vessels to feed itself in a process called angiogenesis.

When a tumor successfully spreads to other parts of the body and grows, invading and destroying other healthy tissues, it is said to have metastasized. This process itself is called metastasis, and the result is a serious condition that is very difficult to treat.

Common Signs, Symptoms and Test of Cancer

Cancers can grow almost anywhere in the body but the most common sites are Lungs, colon or rectum, pancreas, prostate, stomach & digestive tract, urinary system, esophagus, lymph glands. Symptoms of cancer may vary but with any one or more of the following symptoms you should seek expert medical advice without delay. Very often the symptoms may be nothing to do with cancer, but if it is cancer the quicker you are seen by a doctor the better.

Cancer symptoms can include

- Any lump or swelling in the body.
- Swelling of one limb.
- Discharge or bleeding from the mouth, genitals or anus.
- Persistent constipation, diarrhea or indigestion that is unusual for you.
- Difficulty in swallowing or urinating.
- Sudden and unexplained weight loss.
- An increase in the size of a mole or wart, or change in color.
- Dry cough or soreness in the throat that lasts over three weeks.

Like symptoms, the signs of cancer vary based on the type and location of the tumor. Common tests include the following:

- Biopsy of the tumor
- Blood tests (which look for chemicals such as tumor markers)
- Bone marrow biopsy (for lymphoma or leukemia)
- Chest x-ray
- Complete blood count (CBC)
- CT scan
- MRI scan

There are several medicinal plants all over the world, including India, which are being used traditionally for the prevention and treatment of cancer. However, only few medicinal plants have attracted the interest of scientists to investigate the remedy for neoplasm (tumour or cancer). Hence, an attempt has been made to review some medicinal plants used for the prevention and treatment of cancer.

There are 34 medicinal plants of have been collected from the literatures. These plants are used against various types of tumours/cancers such as sarcoma, lymphoma, carcinoma and leukaemia. Many of these medicinal plants have been found effective in experimental and clinical cases of cancers. The **Table no:1** contains the botanical names of the medicinal plants (alphabetically) along with their common names, family names, parts used and the main active components.

Table I:

Botanical Name	Common Name	Family	Parts used	Phytoconstituents
Agave americana	Centary plant,American aloe	Agavaceaae	leaf	Steroidal saponin,coumarin,isoflavonoid,
Agropyron repens	Couch Grass, Twitch-grass	Poaceae	rhizomes	essential oil, polysaccharide and mucilage
Ailanthus altissima	Tree-of-Heaven	Simaroubaceae	bark	triterpene, tannin, saponin and quercetin-3-glucoside
Akebia quinata	Chocolate vine	Lardizabalaceae	fruit	flavonoid and saponins
Alpinea galanga	Blue ginger, galangal root.	Zinziberaceae	rhizomes	Flavon,kaempferide
Argimonia pilosa	Hairoy Gtemonla	Rosaceae	Herbs	Flavonoid,agrimonolide Triterpene,tannin,coumarin.
Aristolochia contorta	Ma Dou Ling	Aristolochiaceae	Root and fruit	lysicamine and oxaaporphine
Broyonia dioica	red bryony and white bryony	Cucurbitaceae	root	cucurbitacin and glycoside
Camtotheca acuminate	Cancer tree	Nyssaceae	Dried stem wood	Quinoline, camtothecin,10-methoxy amptothecin
Cannabis sativa	Konoplia	Cannabinaceae	Leaf	Stereo isomer of cannabitriol
Cantharanthus roseus	Sadabahar	Apocynaceae	Leaves roots	Alkaloids-giberellin, amyrin, catharanthin
Chimaphila umbellate	Prince's Pine	Ericaceae	Whole plant	ericolin, arbutin, urson and tannin
Cephalotaxus harringtonia	Plum yew	Cephalotaxaceae	Shrubs	Harringtonine, Homoharringtonine
Coix lachrymal jobi	Job's Tears	Poaceae	Seed	trans-ferulyl stigmasterol
Colchicum spciosum	Meadow saffron	Liliaceae	Bark	Colchicines, demecolcine
Dryopteris crassirhizoma	Crown Wood Fern	Polypodiaceae	rhizome	filicinic and filicic acids, aspidinol
Eupatorium cannabinum	Boneset	Asteraceae	Whole plant	sesquiterpene, lactone
Erythronium americanum	Toothed violet	Lilaceae	Whole plant	α-methylene butyrolactone
Fragaria vesca	Alpine strawberry	Rosaceae	Leaf and fruit	flavonoid, tannin, ellagic acid
Galium aparine	Goosegrass	Rubiaceae	Cleaver	Polyphenolic acid, tannin, flavonoid,iridoid,Anthraquinone
Hydrastis canadensis	Yellow Root, Yellow Puccoon	Ranunculaceae	Whole plant	isoquinoline alkaloids (hydrastine, berberine, berberastine, candaline)
Lantana camara	Largeleaf lantana	Verbenaceae	Whole plant	Alkaloids ; coumarin, lantanin, Lantadene
Maytenus serrata		Celastraceae	Stem	Alkaloids, Maytanbutine, Maytansine, Maytanprine
Panax quinquefolium	American ginseng	Araliaceae	Root	Ginsenoside, sesquiterpene, Limonene,vit.-B1,B2,B12
Podophyllum peltatum	Himalayan apple	Podophyllaceae	Rhizomes roots	Podophyllin(resin),α and β- peltatin, Podophylotoxin.
Polygonatum multiflorum	Knotgrass	Liliaceae	Whole plant	Saponin,flavonoid,vit-A
Pygeum africanum	Pygeum, Iron Wood	Boraginaceae	Bark	phytosterol, triterpene and tannin
Raphanus sativus	Leafy Daikon	Brassicaceae	Seeds leaves	β-sitosterol, raphanusol-A, malic acid,ferrulic acid,
Rubia akane	Majith	Rubiaceae	Whole plant	Anthraquinone, triterpine
Scrophularia nodosa	woodland figwort	Scrophulariaceae	Aerial part	flavonoid and phenolic acid
Taxus baccata	Yew	Taxaceae	Bark leaf seeds	Taxol, Cephalomannine, Diacetylbaccatin
Taxus brevifolia	Talispatra	Taxaceae	Bark	Taxol, Cephalomannine, Diacetylbaccatin
Urginea indica	Jangli pyaj	Liliaceae	Bulbs	Cardiac glycoside, mucilage, proscillandrin
Viola odorata	Sweet violet	Violaceae	Leaves, root	Alkaloids, methyl salicylate glycoside,

CONCLUSION

Health and disease are two important areas which have engaged attracted the attention of mankind since time immemorial. The primitive man did not know about the medicines. Medicinal plants maintain the health and vitality of individuals, and also cure various

diseases, including cancer without causing toxicity. These medicinal plants have anticancer activities because of their good immunemodulatory and antioxidant properties.

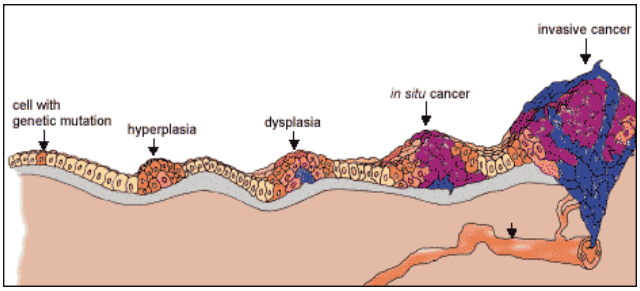

Fig.1: Stages of Tumor Development

REFERENCES

1. Compendium of Indian medicinal plant, volume-3rd(1980-1984.
2. Herbal drugs & Phytopharmaceuticals. A hand book for practice on a scientific basis, 2nd edition , 2001.
3. Indian herbal pharmacopoeia, volume-2nd. A joint publication of regional research laboratory-page no.110.
4. Kokate CK, purohit AP and Gokhale SB. Text book of pharmacognosy (Nirali prakashan).
5. Trease & Evans, pharmacognosy, 15th edition.
6. The Wealth of India, volume-3rd ,National Institute of Science communication, council of Scientific& Industrial research, New Delhi-110012.
7. Schuster BG. J Alterm Complement Med. 2001;7(1):561-572.
8. Talalay P and Talalay Acad. Med. Mar. 2001;76(3): 238-247.
9. Prajapati ND, Purohit SS, Sharma AK and Kumar T. A Hand Book of Medicinal Plants, Agro bios (India), 2003, 1st edition.