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Sesquiterpenoidal lactones : Good Naturally Occuring Anticancer Therapeautic agents

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Abstract :

Cancer is a highly life thereatening disease. It is the second leading cause of death after heart disease. Owing to intensive side effects of chemo as well as radiotherapy constant efforts are being made to fiind out natural potent antitumor biocomponents with fewer side effects. Among the naturally occuring cytotoxic agents, Sesquiterpene lactones have been found to be much effective against various forms of cancer. Parthenolides, Artimisinin and xanthinin have been evaluated successfully as anti tumor therapeautic bio-active compounds.

Keywords : Therapeautic, Cytotoxic, Artimisinin.

Introduction :

Exposure of carcinogenic chemicals, ionising radiation or genetic mutation may cause genetic change leading the uncontrolled or abnormal cellular growth. Abnormal growth of cells may convert into tumor. Sometimes a tumor may be localised and non harmful is called benign tumor. Sometimes it may be malignant. If these cells leave from one organ to other called metastatis. Generally cancer can be divided into four categories, on the basis of origin.

(i)	Carcinama	-	Skin or tissue
(ii)	Sarcoma	-	Connective tissue, bone, blood vessels
(iii)	Leukemia	-	Bone Marrow
(iv)	Lymphoma	-	Immune system

Chemotherapy and radiotherapy are the major eradication methods of cancer treatment. Due to their severe harmful effects, researches are going on to replace modern allopathic method of treatment with fewer ill effects. In this perspect there are number of naturally occuring bioactive compounds having 15 carbons. Consisting 3 isoprene units

with a characteristic ring system including lactone ring [1] showing anti-biotic and antitumor effects[2]. Podophyllotoxin isolated from podophyllum peltatum was the first natural compound which led the development of herbal drug to treat the testicular and lung cancer [3]. Vinka rosa alkaloids, vincristine and vinblastin have been effective in practice to cure certain types of malignant conditions. Chinese plant campotheca accuminata has been also reported to posses cytotoxic acttivity by virtue of its bioactive component 'Campothecin'.

MATERIAL & METHOD :

Enough evidences are there that xauthium species of family compositeae contain sesquiterpene lactones. Deep literature survey also reveals that bioactive compound, artimisinin and its synthetic analogue have been established as reputed anti cancer activity[4]. Sesquiterpene lactones isolated and identified have been listed below List (1)

List of sesterpenoidal lactones - [5, 6, 7]

S.No.	Name of the plant	Part	Isolated Ses.T.Lactones
1	Xanthium Strumarium	Root, Leaves, Stem	Xanthatin, Xanthinin Xanthanol, Xanthumin
2	Xanthium Spinosum	Whole Plant	Xanthatin
3	Xanthium Occidental	Areal Part	Xanthumin
4	Xanthium Indicum	-----" " -----	2-epi xanthumin
5	Artimisia annua	-----" " -----	Artimisinin
6	Tanacetum parthenium	-----whole plant" " -----	Parthenolides
7	Thapsia garganica	-----" " -----	Thapsigargin
8	Murrubium Vulgare	-----" " -----	Vulgarin
9	Artimisia Cina	-----" " -----	Santonin

STRUCTURE AND ACTIVITY :

It has been established that there is a close relation between the structure of sesquiterpene lactone and cytotoxicity. Various studies reveal that naturally occurring bioactive compounds possess exomethylene moiety conjugated to carbonyl group[7] .

IR band at 1605, 1595 cm-1 confirm the presence of unsturated dienone and IR band at 1765 cm-1 also confirm for s-lactone part [8]. Such therapeautic agents also give

red colour with 10% Hcl, red rose colour with 10% KoH and positive hydroxamic test for lactone ring also.

RESULT & DISCUSSION :

Various research and studies exhibit that naturally occuring anticancer therapeautics have some common structural characteristics. majority of bioactive compounds show cytotoxic activity or able to prevent uncontrolled cellular growth due to the presence of exomethylene double bond conjugated to carbonyl group also having lactone ring.

CONCLUSION :

Apart from sesquiterpene lactones numerous natural bioactive compounds are there which have been well authenticated for their potential anti-ttumor activity with lower side effects. Still further study of unknoun flora is required to achieve the desired bioactive medicines.

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