

Xanthium Plants, Boon for the Cancer

A.H. ANSARI

Professor, Department of Chemistry
Govt. P. G. College, Damoh, M.P. (India)

(Acceptance Date 28th November, 2014)

Abstract

The Present paper deals the presence of potential antitumor activity of the compounds isolated from xanthium species of composite a family. Enough evidences prove that sesquiterpenoidal lactones present the above plants posses good anti cancerous reputation.

Since the dawn of human creation, diseases , decay and death have coexisted with life and have been threatening mankind. Even today no country of the world can claim to have obtained complete expertise in conquering all diseases. Still some of them are fully undiscovered¹⁻⁷.

The prolong use of modern drugs and their effect specially of some powerful antibiotics have compelled the scientists to look for the entire genera of medicinal flora. Due to its varied climatic conditions, our nation is bestowed with the richest medicinal flora of the world⁸⁻¹⁰.

Enough evidences are there for having adequate proof of the use of higher plants for the treatment of various diseases including CANCER, for centuries. A complete survey of literature reveals about the number of plants, which have reputation as anticancerous agents' e.g. Vincristine and Vinblastine.

During the survey of available literature on carcinogen, podophyllum was the first to be used as an anticancer drug about 2000 years ago by the ancient Chinese. The alkaloids of Vincarosea, Vincaleukoblastine and Vincristine are found to be effective in certain forms of malignant neoplastic conditions of man. Camtothecin and its derivatives, alkaloids from the Chinese tree comptotheca acuminata is reported to be used for the treatment of cancer in China Bruceantine, which is isolated from Brucea antidysenterica is used in Ethopia for the treatment of cancer which showed high antitumour activity at low doses with most of side effects⁶⁻¹⁰.

Compounds Isolated From Xanthium Species :

There exists enough examples of use of large number of sesquiterpenoidal lactones which have been isolated and identified during period of search for antitumour agents of plant origin. During past 30 years over 500

Table

S.No.	Name of the Plants	Plants Parts	Compound isolated (Xanthanolides)
1	Xanthium strumarium	Roots, Leaves, Leaves Stem	<ul style="list-style-type: none"> • Xanthatin • Xanthinin • Xanthanol • Xanthumin
2.	Xanthium spinosum	Whole plant	Xanthatin
3.	Xanthium occidentale	Aerial parts	Xanthumin
4.	Xanthium indicum	Aerial parts	2-epixanthumin

sesquiterpene lactones have been isolated; from the available literature it has been found that amongst the anticancerous plant, the xanthium plants possess a good reputation. A deep survey of literature indicated that various species of xanthium plants which belongs to compositea family have various xanthanoloids constituents which have been tabulated.

The above table clearly shows that several undefined compounds and other species require further phytochemical investigations.

Examination of above sesquiterpenoidal lactones indicates that the presences of functional group such as epoxide, hydroxyl, unsaturated ketones and exocyclic methylene conjugated to lactone enhances the reactivity and cytotoxicity. Various spectral studies reveal the presence of such cytotoxic groups in above tabulated xanthanolides. IR bands at 1687, 1605, 1595 cm^{-1} clearly show the presence of unsaturated dienone system. Another band at

1765 cm^{-1} also indicates that latter is part of γ lactone moiety. ^1H NMR spectra also reveal the presence of such groups in above sesquiterpenoidal lactones.

Crude xanthanoloids²⁻¹⁰ obtained from above plants also respond the positive test for sesquiterpene lactones i.e. red colour with HCL and resorcinol, red rose colour with 10% KOH and they also gives hydroxamic test showing the presence of lactone ring.

References

1. The wealth of india, A Dictionary of Indian raw materials and industrial products; CSIR publication New Delhi vol. III p 1-4 (1976).
2. Chopra R.N. chopra, I.C. Nayar, S.L., 'Glossary of Indian medicinal plants' CSIR pub. New Delhi p259 (1956).
3. Nigg, H.N., Strandberg, J.O. Beir, R.C. Petersen, H.O. Harrison, J.M. 'Journal of agri. & food chemistry' M 45 (4), p. 1430-1436 (1997).

4. Sina, R.D. singh, A.P. Sinha, B.B.P. Li A.S.M., '*Journal of Appl. Biological*'. M. (1-2) p-93 (1995).
5. Malik, M.N., Fenko, M.D., Sheikh, A.M., '*Journal of agri. & food chemistry*' V 45 (3), p. 817-819 (1997).
6. Konishi, T. Inoue, T. Kiyosowa, S. Fuiwara, Y., '*phylochemistry*' Vol. 43(4), p- 867-69 (1996).
7. Van, Heerden, F.R., Van wyk, B.E., Vilijoeh, A.M. '*Phyto chemistry* 1982, vol. 43(4) P- 867-69 (1996).
8. Bohlmann, Faridinand, Singh, Pahuf, Joshi, Krishna, Singh Chandra, L, '*Phyto chemistry*, vol. 21(6) P- 1441-43 (1982).
9. Griffin, T.A., Geissman, T.A., winters, T.E., '*Phytochemistry*, vol. 10, P- 2487 (1971).
10. Geissman, T.A., in Terpehoids, structures, Biogenesis and Distribution, '*Recent advances in Phytochemistry*, 06, p-65 (1973).