

A systemic review of Indian medicinal plants with anti-tumor effects

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Abstract

Tumor is the second largest cause of the increase in the morbidity rate. It is spreading all over the world in all age groups it is chronic disease. If it remains untreated at the early stages, then it may convert into cancer. So, it important to treat this at the early stage by using different supplements and drugs. The drugs used for the treatment of the tumor are having very side effects, so it gave rise for the development of the herbal drugs for tumor as they are having less side effects and are cheap. Herbal drugs are playing an important role in treating the tumor with minimal side effects. The drugs which are used as the anti-tumor agents are acting by inhibiting the proliferation of the tumor and inhibiting its progression. The drugs which are of Indian origin are taken in consideration for the study for example *Curcuma longa*, *Rubus ellipticus* etc.

1. Introduction

In ancient times only non-woody plants are termed as herbs. Herbs or plants used for medicinal purposes are known as medicinal plants. Indian forests are the rich source of the medicinal plants. About 8000 herbal remedies have been codified in various medicinal systems of India [1]. The main reason for the use of the herbal drugs is that there are no or minimal side effects. Some of the herbal drugs are used for the treatment of the cancer by enhancing detoxification of body [2].

A tumour is an uncontrolled and abnormal growth of cells that play no role. Tumour is of two types: benign and malignant. A benign tumour does not spread to other parts of body like cancer. Benign tumour can be serious if they press on vital structures such as blood vessels or nerves. So, they require treatment in some cases. The phenotypic changes which a cell undergoes in the process of malignant transformation reflects the sequential acquisition of genetic alterations [3].

In today's world there are many acute and chronic diseases which are spreading all over the world, tumor is one of the most common and serious disease among them. Tumor is the second largest disease which is spreading more day by day in every age group. It is one of the reasons for the increase in death rate of the world population because of any disease. It is very common now a days, as it is there in one of the ten persons. It is common with every age group and every part of the body. It is differed from cancer only in the way that it is not spreading to other parts of the body and remain confined to the one part of the body. There are many types of the treatments available for tumor including surgery, chemotherapy, radiations etc. There are many kinds of the allopathic medicines which are available for the treatment of the tumor, but they are having many side effects like alopecia, vomiting, nausea, blurred vision etc. Because of such side effects they are not good for use so there is need for the development of the herbal medicines which are having very low or no side effects. In this study we are going to focus on the medicinal plants which are used for the treatment of the tumor and having very less or minimal side effects. Some of the plants which are having anti-tumor activity

are discussed below which are having less side effects and are mainly present in India. As this study deals with the plants of Indian origin therefore plants selected for the study are of India only.

2. Plants used in the treatment of tumor

Various herbal drugs used these days to treat tumor are generally plant based and this traditional knowledge further become the basis of future research. Crude drugs or isolated phytoconstituents are therefore called as major precursor of various conventional medicines. Here, we discuss some traditional medicinal plants assessed scientifically against tumor.

2.1. *Cinnamomum tamala*: It is also known as Tejpatta. It belongs to the family Lauraceae. It was found in India, Bangladesh, Nepal, Bhutan, Pacific region, South America and China [4]. It is used for diabetes, cough, cold, arthritis, asthma, skin allergies. The leaves and bark of the plant are used for the medicinal purposes. In recent studies it is proved that *C. tamala* is having the anti-tumor activity also [5]. The bioactive constituents of the *C. tamala* are cinnamaldehyde trans-cinnamyl acetate, beta-caryophyllene and eugenol [6]. Crude methanolic extract of *C. tamala* is used for anti-tumor purpose. The animal model in which it shows the reduction in the tumor is fibrosarcoma induced mice at the dose of 200 mg/kg. It not only kills the tumor cells. This study reveals that the terpenoid content is responsible for the anti tumor activity as when GC is done for the MECT the content of the terpenoid was more and it is active phytochemical. The tumor weight significantly reduces by the methanol extract of the *C. tamala* [7].

2.2. *Rubus ellipticus*: It is also known as golden Himalayan raspberry or yellow Himalayan raspberry. It belongs to the family Rosacea [8]. It has variety of uses such as astringent, peptic ulcers, sore throat, renal failure, polyuria, antitumor. It is very useful in treating the tumor. The plant is used for the anti-tumor activity. The methanolic extract of the *R. ellipticus* species is used for the anti tumor purpose, the extract was formed in organic solvent. Swiss albino mice are used for solid tumor development treatment. It acts by the inhibition of the EAC proliferation. DLA cell lines were injected subcutaneously which will develop solid tumor. Different doses of methanol extract of *R. ellipticus* were given to the animals like 50 mg/kg, 100 mg/kg and 250 mg/kg. After 10 days the reduction in the tumor was noted and anti-tumor property of *R. ellipticus* was proved in methanol extract of *R. ellipticus*. 250 mg/kg was found to be most affected by the methanol extract of *R. ellipticus* as it causes the reduction in the tumor growth in DLA. The increase in life span of the mice given methanol extract of *R. ellipticus* was noted which shows that it is effective in treating the tumor [9].

2.3. *Hypericum hookerianum*: It is also known as the Hooker's St. John's Wort, family Hypericaceae [10]. It is used as anti-oxidant and anti-tumor agent. It is also used to treat anxiety, depression and sleep disorders. The flowers, stem and leaves of the plant are used for the medicinal purposes. Species of the genus hypericum possess cytotoxic and anti-tumor property [11]. The methanol extract of the plant was used as the anti-tumor agent. EAC cells were transplanted in the Swiss albino mice to develop tumor in animal. The different concentrations of the methanol extract were used like 100, 200 and 400mg/kg. The treatment was done after 24 hours of the tumor development. The 200mg/kg concentration was found to be more potent in inhibiting

the proliferation of the EAC. The increase in the life span of the tumor induced animals was observed which shows that methanol extract is very useful in treating the tumor [12].

2.4. *Curcuma aromatica*: It is the member of the genus *Curcuma*, family Zingiberaceae. It is native to Asian countries like India, China and Japan. It is found in the south India. It is widely used as the anti-oxidant, anti-microbial, anti-inflammatory, anti-cancer and anti-angiogenic agent [13][14][15]. The essential oil of *C. aromatica* is used for the anti-tumor activity. The rhizomes of the plant are used for the medicinal purpose [16]. The 30 mcg/ml dose was given to mice for the anti-tumor activity. Germacrone is the main bioactive component of *C. aromatica* and is used as anti-tumor activity by inhibiting the proliferation of the tumor cells. It induces G2/M cell cycle and promote apoptosis [17]. The study uses prostate cancer cells and melanoma cells are used. Drug used is in form of essential oil after the steam distillation of the crude drug. Zingiberene and turmerone are the active constituents which are helpful in suppressing the tumor [18].

2.5. *Aponogeton undulates*: It is also known as green bulb. It belongs to the family Aponogetonaceae. It is an aquatic species. It is used for anaemia, diabetes, haemothermia. Its extracts are used as anti-microbial, anti-inflammatory, cytotoxic, anti-oxidant and anti-tumor [19]. The leaves of the plant are used as the medicinal purpose. The leaves are taken and crushed and then the methanol extract was prepared from those leaves. EAC cells were transplanted to the Swiss albino mice for the development of tumor, after 24 hours of the implantation the extracted drug was given to the animals for 10 days. The doses given to the animals were 50, 100, 200 mg/kg. After 10 days the animals were examined for the anti-tumor activity. The animals which were given the *A. undulatus* show anti-tumor activity by reduction in the weight and growth of tumor, which ultimately shows that it is having the anti-tumor activity. The 200 mg/kg dose shows the most significant results of the anti-tumor activity [20].

3. Discussion:

Herbal medicines are the any part of the plant which is used for the medicinal purpose. The plants were being used for the medicinal purpose from about the last decades. The traditional methods of medicines use plants for treatment of the diseases. There are about 8000 medicinal remedies which has been in use till now. Most of the medicines now a days are also plant based. Herbal medicines are in use now because they are having very less side effects. There are reports which states that plant extracts are used for antioxidant, antitumor, anti-inflammatory etc. purposes which clearly indicates that the plants are very helpful in treating any kind of disease. Tumor is the uncontrolled growth of the cells which are of no use. Benign tumor is the tumor in which cells remain confined to the part of the body whereas in malignant tumor cells will spread to other parts of the body. If the benign tumor remain untreated it will turn into malignant tumor and causes cancer. There are many drugs available for treatment of the tumor like *Priviso*, *Relaxium lactium* etc. but they are having several side effects which makes the need of the development of the drugs which will be having minimal side effects. The need for the development of the drugs with minimal side effects gives rise for the development of the herbal plants as they are having minimal side effects. There are several plants which shows the antitumor activity like *Cinnamomum tamala*, *curcuma longa* etc. which act by inhibiting EAC proliferation which

ultimately results in reduction of the tumor and increase the life span of the animal. The anti-tumor activity of the plants are basically tested in the Swiss albino mice in which mice were injected the tumor causing agents or cell lines and then they are provided with the treatment of the herbal plant and observed for few days and the results were found that plants with anti-tumor activities show reduction in the tumor cells and increase in the life span of the animal. In future there is need of the drugs which will be having very less side effects as the drugs used now a days are having very much side effects due to which people avoid to take those medicines and it ultimately gives rise to the development of the drugs which are totally plant based.

4. Conclusion

The result of this study is indicating that the herbal plants are significantly showing the positive results in treating the tumor. The different plants are used for the determination of the in-vivo as well as in-vitro antitumor activity. The results of the study stated that after the use of the herbal medicinal extracts the reduction in the tumor is seen and there are minimal side effects observed after the treatment with herbal extracts. As it is reported that tumor is the second largest death causing disease so it is important to develop some new molecules which are plant based because of the less side effects of the plant based drugs to eradicate the alarming conditions of the disease and helping the people to overcome the problems of tumor. With the advancement or development of the new herbal medicines there will be decline in the morbidity rate all over the world. So, there is a dire need of the herbal medicine's development for the sake of the people welfare.

5. References

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