



# A Review on Medicinal Plants with Anticancer Activity Available In Bangladesh



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## Abstract

**Background:** Cancer; one of the leading causes of death and a very few medicines are available in the marketplace to treat cancer but no drug is found so far to be fully capable to treat. Generally plants along with plant consequent products have proved more successful and safe in the treatment and administration of cancers.

**Methodology:** Here an attempt is being made throughout this article to highlight medicinal plants known as anti-cancer agents and the latest plant species branded with anti-cancer properties available in Bangladesh. Here a bibliographic study was carried out by analyzing conventional text books and peer reviewed papers, consulting wide-reaching accepted scientific databases. In this review, the investigation terms were “cancer” in addition to (“herbal medicine Bangladesh” or “plant Bangladesh”, “medicinal plants Bangladesh” or “medicine traditional Bangladesh”) with no limiting search objects. Later it was cross checked whether the plants were available in the country or not from the Bangladeshi online medicinal plants databases.

**Outcomes:** Anti-cancer properties of different plants are being acknowledged comprehensive. There are a few plants are existing in Bangladesh with such properties and among them; *Allium sativum*, *Achyranthes aspera*, *Andrographis paniculata*, *Cannabis sativa*, *Camellia sinensis*, *Oroxylum indicum*, *Terminalia chebula*, *Withania somnifera*, *Zingiber officinale* and *Mangifera indica* are most common.

**Conclusion:** The information collected here will take part in an essential role to develop new drug formulation for cancer treatment and further research should be done on above mentioned plants.

**Keywords:** Medicinal plants; Anticancer effect; Bangladesh; Pharmacology

## Introduction

A disease originated by an uncontrolled splitting up of anomalous cells in a fraction of the body is called cancer. Cancer cells typically attack as well as obliterate normal cells. Cancer is one of the foremost public health burdens in both developed and developing countries [1-3]. In Bangladesh, 13% death due to disease belongs to cancer. Natural Products such as plants have been used for the treatment of different diseases for thousands of years. Global plants have been used as medicines in Egypt, China, India and Greece and in many countries from ancient time and an extraordinary number of modern drugs have been developed from them [4-9]. Medicinal plants remain on to be a central therapeutic assist used for alleviating ailments of human race. Over the last 2500 years, here have been very strongly built traditional systems of medicine such as Ayurvedic, and the Unani [10-12].

These plants restrain materials that can be utilized for useful purposes, of which are originators for the synthesis of drugs. Plenty of research work has been carried out on a number of medicinal herbs as well as they have been initiate to have definite action on the respiratory, nervous, circulatory, digestive and urinary organisms, sexual organs, skin, hearing, vision, and taste. The exploration for anti-cancer means on or after plant sources started during the

1950s. Moreover like other countries in Bangladesh, there are lot of research has been done and some research is still going on as it is to be mentioned that till now the best source of anticancer agents is medicinal plant [13-16]. The major target of this review article was to give some information to Bangladeshi researchers about some medicinal plants having anticancer properties available in Bangladesh.

## Methodology

### Search strategy

Conventional text books and databases such as Web of Science, Scopus, PubMed were searched for scientific articles published till January, 2018, using the following descriptors: “cancer”, “herbal medicine Bangladesh” or “plant Bangladesh”, “medicinal plants Bangladesh” or “medicine traditional Bangladesh” without restriction on the language of the articles and without limiting the search items.

### Inclusion and exclusion criteria

Both reviews and original works on medicinal plants were considered, including those that cited the plant species referenced

for cancer treatment, with botanical identification correctly described according to the Ethnobotanical Database of Bangladesh (EDB) (<http://www.ethnobotanybd.com/>) and Medicinal Plants of Bangladesh (<http://www.mpbd.info/>). Ethnopharmacological articles that offered possible methodological bias in terms of sample superiority and validity of the species described in the study were not considered and were excluded.

### Data analysis

To examine and assemble the objects, an investigative reading of the bibliographic materials were conducted, assessing the title and abstract of the work. After that, the articles that appeared in the results of all were verified. After completing the investigative

analysis, a selective reading of the articles that included plant species with botanical records were done furthermore were checked in as information contained in the consulted periodicals were performed, thus allowing the collection of the data from the bibliographic review. Information on anti-cancer action was obtained directly from the selected articles.

### Outcomes

There are a lot of work has been carried out on the effect of plants and some plants showed noteworthy potentiality to battle against cancer. A demographic description of available plants having anticancer properties in Bangladesh is provided in Table 1.

**Table 1:** Demographic information about the available plants with anticancer properties.

Scientific Name	Family	English Name	Bengali Name
<i>Allium sativum</i>	Liliaceae	Garlic.	Rasun
<i>Achyranthes aspera</i>	Amaranthaceae	Prickly Chaff-flower, Rough Chaff Tree, Red Chaff Tree.	Apang, Uputhlengra.
<i>Andrographis paniculata</i>	Acanthaceae	The Creat	Kalomegh, Kalamegh
<i>Cannabis sativa</i>	Cannabidaceae	Hemp, True Hemp, Soft Hemp	Ganja, Bhang, Charas, Siddhi
<i>Camellia sinensis</i>	Theaceae	Tea	Cha, Chapata
<i>Oroxylum indicum</i>	Bignoniaceae	Indian Trumpet Flower	Khona, Sona, Hona, Nasona, Patti,
<i>Terminalia chebula</i>	Combretaceae	Black Myrobalan, Chebulic Myrobalan, Ink Nut, Gall nut	Haritaki, Hartaki
<i>Withania somnifera</i>	Solanaceae	Winter Cherry	Aswagandha, Choto Dhuppa
<i>Zingiber officinale</i>	Zingiberaceae	Ginger	Ada, Shuth
<i>Mangifera indica</i>	Anacardiaceae	Mango	Am
<i>Curcuma longa L.</i>	Zingiberaceae	Turmeric	Halud, Haldi
<i>Syzygium aromaticum</i>	Myrtaceae	clove	Labanga
<i>Allium cepa</i>	Liliaceae	Onion	Piyaj
<b>Source:</b>			
1. <a href="http://www.ethnobotanybd.com/">http://www.ethnobotanybd.com/</a>			
2. <a href="http://www.mpbd.info/">http://www.mpbd.info/</a>			

### ***Allium sativum* (Allicin)**

*Allium sativum* (garlic, lasun) is worn to treat a wide diversity of diseases in Bangladesh. It is cultivated in most of the districts of Bangladesh [17]. Allicin is a principal constituent of raw garlic [18]. Some research demonstrated that its cytotoxic effect has been experienced using a everlasting, human principal fibroblasts, non tumorigenic cell line significant from baby hamster kidney cells and a tumorigenic lymphoid cell line ensuing from a Burkitt lymphoma [19]. It was also instituted that the cytotoxic exploit was in the range 2-50µg/ml. It is to be mentioned that the most important fact is a number of organo-sulfur compounds commencing garlic, like S-allylcysteine, are accounted to inhibit the growth of chemically persuaded besides transplantable tumors in reasonably a lot of animal models [20,21].

### ***Achyranthes aspera***

*Achyranthes aspera* Linn is an often originated herb as an uncultivated plant on road sides all through Bangladesh [22]. It is derived from all over the country in way sides along with crop-free lands [23]. The methanol extract of its alkaloid along with non-alkaloid and saponin fractions have been verified noteworthy inhibitory belongings on the Epstein-Barr virus close to the starting antigen commencement persuaded by the carcinogen 12-O-tetradecanoylphorbol-13-acetate in Raji cells at a concentration of 100µg. Throughout in vivo it is found that two-stage mouse skin carcinogenesis examination the total methanol extract obsessive a pronounced cytotoxic tumult and in vitro study it is found that the non-alkaloid portions containing mainly non polar complexes showed the bulk of note inhibitory act [24,25].

### ***Andrographis paniculata***

It is originated in Chittagong and Chittagong Hill Tracts [26]. A number of previous phytochemical study of the ethanol extract of the airborne fractions of *Andrographis paniculata* has been noted the segregation of 14 compounds as well as a better part of them are labdane diterpenoids and also flavonoids [26]. It is to be mentioned that the cytotoxic actions of these compounds have been reviewed against a variety of cell lines and instituted with the rationale of these isolates have a strong tumour inhibitory activity bordering to all examined cell lines which is very considerable. Also, there are a few unnecessary side effects were additionally reported which may embrace gastric upset and fatigue, headache and disturbance of the regular functions of liver and bitter taste too [27,28].

### ***Cannabis sativa***

It is originated in Dhaka, Chittagong, Chittagong Hill Tracts, Dinajpur, Faridpur, Jessore, Kushtia, Rajshahi, Rangpur [29]. The dynamic mechanisms of *Cannabis sativa* are known as cannabinoids. Some previous research demonstrated that *in vitro* studies of apparatus of marijuana (*Cannabis sativa*) assign a prospective to reduce human breast cancer cells and also to build tumor eradications. It is also significant to know that in some experiments bringing in marijuana to malignant brain tumors, it was recognized that continued survival of animals was increased

noticeably [30-33].

### ***Camellia sinensis* (Green Tea)**

It is basically found in Sylhet, Moulvi Bazar, Chittagong, Chittagong Hill Tracts, Panchagar and Dinajpur [34]. It is to be mentioned that the majority abundant polyphenol in green tea is Epigallocatechin-3-gallate (EGCG). Some previous research demonstrated that EGCG suppress the growth of cancer cell lines similar to hepatocellular carcinoma from side to side beginning of cell cycle arrest. Moreover, some research showed that the increase of cancer cells within ovarian carcinoma is as well inhibited cell EGCG [35,36].

### ***Oroxylum indicum***

It is originated in the forests of Chittagong, Cox's Bazar, Chittagong Hill Tracts, Dhaka-Tangail and also in village shrubberies and farmhouses all through the country [37]. The plant is used in a variety of polyherbal formulations Bangladeshi method of medicine. Some previous studies have established anticancer potential of *Oroxylum indicum* by means of a range of models furthermore stated in some research that 95% ethanol extract illustrated cytotoxic activity contiguous to Hep2 cell lines at a manifestation of 0.05% and most importantly extract of *Oroxylum indicum* established the toxicity on tumor cell lines tested while aqueous extracts and methanolic of *Oroxylum indicum* have been demonstrated prevalent cytotoxicity in chosen tested cell lines [38-41].

### ***Terminalia chebula***

*Terminalia chebula* is found in Dhaka, Chittagong, Tangail; cultivated in many parts of the country [42]. The plant is a superior source of hydrolysable tannis and also its anti mutagenic feat in *Salmonella typhimurium* has been recognized in some research. Some prior research stated that *Terminalia chebula* fruits crush along with its acetone haul beyond bark have been accounted with capable of anti mutagenic and anti carcinogenic association in addition to most importantly Phenols akin to chebulinic acid and ellagic acid and tannic acid are the cancer growth inhibitors introduced within the fruits of *Terminalia chebula* [43,44].

### ***Withania somnifera* (Withanolides)**

It is basically originated in North Bengal site of Bangladesh [45]. *Withania somnifera* is extremely valued in Ayurveda intended for cancer patients. It is also used as a remedy for fighting the cancer like situation. It is to be mentioned that the roots of *Withania somnifera* are helpful parts. A number previous research remarked that during vitro study with anolides from *Withania somnifera* abridged the enlargement of cancer cells in human breast as well as central nervous system [46-48].

### ***Zingiber officinale***

It is cultured all over the country. Some research were done previously on *Zingiber officinale* and found that ethanol extract to find out its antitumor possessions in skin tumor genesis model of mice and also on top of the skin of mice resulted in essential reticence of 12-O-tetradecanoylphorbol-13-acetate (TPA) rational

initiation of epidermal ODC and additionally cyclo oxygenase and lipoxygenase actions. Some research on natural bio-actives of entirely ginger extract and 6-gingerol suggested a mechanism of act of ginger extract on colon cancer cells perhaps striking the G0/G1-phase, reducing DNA synthesis and its oppression [49,50].

### *Mangifera indica*

It is a very common fruit in Bangladeshi market. It is found and cultivated all over Bangladesh [51]. It is a nutritional add-on used in frequent tribes as a folklore medication. Some prior research on *Mangifera indica* stated that it showed a huge enhancement of excellence of life in cancer patients and that is the most significant fact about the plant [52,53].

### *Curcuma longa L*

It is cultivated all over Bangladesh. It is found that turmeric has been used in the Chinese and Indian pharmacopoeia from ancient time. It is known that turmeric's active ingredient is an extracted compound called curcumin. Some previous studies showed that that curcumin helps to prevent several forms of cancer including lung, breast, stomach, liver, and colon because of its anti-inflammatory as well as antioxidant properties. It stops the growth of cancer by interfering with the cellular signaling phases of cancer [54,55].

### *Syzygium aromaticum*

It is cultivated all over Bangladesh. The previous research showed that clove essential oil relates to its anti-cancer benefits. It has the ability to kill cancer cells and as a natural chemo preventive agent. Clove essential oil has been found to contain cytotoxic which means cancer cell killing properties against a line of breast cancer cells known as MCF-7 [56-61].

### *Allium cepa*

It is cultivated in most of the districts of Bangladesh. Some previous study has found that a natural compound collected from onions named onion in A (ONA) has quite a few anti-ovarian cancer properties. The effects of ONA were tested on a preclinical model of epithelial ovarian cancer (EOC) both in vivo and in vitro. The outcome was satisfactory [62-68].

### Conclusion

Medicinal plants will be a significant part in the management of cancer gradually in near future. Available Bangladeshi medicinal plants with ability to decrease the expansion of cancer or be used as adjuvant with cancer treatments for patients were described through this comprehensive review. Information that is provided will basically help to design new drug formation not only in ayurvedic but also modern drugs. Further research should be conducted on these plants.

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