



**A review on Functional effects of medicinal plants for
cancer treatment.**

By

Umasree Howlader

Student ID: 191-29-230

A project submitted to the Department of Pharmacy in partial fulfillment
of the requirements for the degree of Bachelor of Pharmacy. (hons)

Department of Pharmacy

Faculty of Allied Health Science

Daffodil International University

.....

April 2023

DECLARATION

I hereby declare that this project report is “**A review of the functional effects of medicinal plants for cancer treatment**”. I further declare that this is my primary work. I can finally say that no part of this work has been submitted for graduation or any grade distinction.

Supervised By

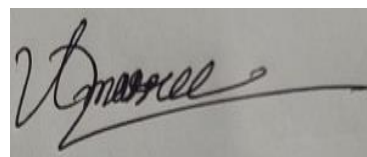


Md. Sadman Hasib

Department of Pharmacy

Daffodil International University

Submitted By



Umasree Howlader

Department of Pharmacy

Daffodil International University

APPROVAL

The project titled (**“Functional effects of medicinal plants for cancer treatment”**) Submitted by Umasree Howlader, Department of Pharmacy, Faculty of Allied Health Science, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of Bachelor of Pharmacy and approved as to its style and contents.

EXAMINING COMMITTEE

.....

Dr. Muniruddin Ahmed

Professor and Head,

Department of Pharmacy

Faculty of Allied Health Science

Daffodil International University

.....Internal Examiner 1

.....Internal Examiner 2

.....External Examiner3

DEDICATION

I dedicate this project to my beloved parents and husband to always love me endlessly and always stand by me.

ACKNOWLEDGEMENT

All praises to Almighty for his unlimited mercy and blessing which he poured me with, to make me competent in executing this project work.

I would like to say my humble respects to Dr. Muniruddin Ahmed, Professor, and Head, of the Department of Pharmacy, Daffodil International University.

I also wish to offer my regard to all of the preceptors of the pharmacy department, at Daffodil International University and am gratified to other members for their excellent cooperation with us.

Eventually, I would like to say my respects to my parents and my husband who keep inspiring me to get on beyond my qualification. I could not have come this far because of their unconditional love.

Table of Contents

Abstract.....	1
Methods.....	2
Chapter 1: Introduction	
1.1 Cancer.....	3
1.2 Cancer Development.....	4
1.3 Types of cancer.....	5
1.4 Cause of cancer.....	5
1.5 Symptoms of Cancer.....	6
Chapter 2: Treatment	
2.1 Types of cancer treatment.....	7
2.2 Role of Natural Products in treating cancer.....	7
2.3 Medicinal Plant use of cancer Treatment.....	7
Chapter 3: Medicinal Plant	
3.1 Definition.....	9
3.2 Medicinal Plants as Anticancer Agent.....	9
3.3 Azadirachta indica.....	12
3.4 Phyllanthus emblica.....	12
3.5 Terminalia chebula.....	13
3.6 Withania somnifera	13
3.7 Zingiber officinale.....	14
3.8 Allium sativum	15
3.9 Nigella sativa.....	15
3.10 Cannabis sativa.....	16

3.11	Camellia sinensis.....	16
3.12	Hibiscus rosa-sinensis.....	17
Chapter 4: Discussion.....		18
Chapter 5: Conclusion.....		19
Chapter 6: References.....		20

List of figures

Figure 1: Mutation of Cells.....	3
Figure 2: Cancer Development cycle.....	4
Figure 3: Azadirachta indica (neem).....	12
Figure 4: Phyllanthus emblica (amloki).....	13
Figure 5: Terminalia chebula (hartaki).....	13
Figure 6: Withania somnifera (ashwagandha).....	14
Figure 7: Zingiber officinale (ada).....	14
Figure 8: Allium sativum (Rashun).....	15
Figure 9: Nigella sativa (kalojiraa).....	16
Figure 10: Cannabis sativa (gaja).....	16
Figure 11: Camellia sinensis (tea).....	17
Figure 12: Hibiscus rosa-sinensis (joba).....	17

List of tables

Table 1: The therapeutic potential of plants leaf extract.....	9
Table 2: The therapeutic potential of plants root and other extract.....	10

ABSTRACT

Currently, Cancer is known as one of the most common diseases. There are various cures currently in use to get rid of deadly diseases. Among them, chemotherapy is the most destructive method and it goes over the budget for people. But on the other hand medicinal plants are budget friendly for people and are easily available and medicinal plants play a very important role in cancer prevention as they have no side effects. Due to these side effects, medicinal plants have become the focus of human interest in cancer prevention. Bangladesh is an agriculturally dominant country and a variety of medicinal plants are available here.^[1] Various natural products and their indications act as powerful anticancer agents. Commonly Bangladesh is notable among the various medicinal plants available for cancer treatment. Such as *PHYLLANTHUS EMBLICA*, *TERMINALIA CHEBULA*, *WITHANIA SOMNIFERA*, *AZADIRACHTA INDICA*, *ZINGIBER OFFICINALE*, *ALLIUM SATIVUM*, *CINNAMOMUM VERUM*, *NIGELLA SATIVA*, *CATHARANTHUS ROSEUS*, *CANNABIS SATIVA*, *CAMELLIA SINENSIS*, *SOPHORA LANSIS*, *HIPERLANSIS*, etc. This review discusses the unique contribution of medicinal plants to cancer treatment through phytochemical assays.^[2]

Keywords: Cancer, Medicinal plants, Metabolites, Anticancer medicine, Natural products.

METHOD

This review is one of the most popular reviews by scientists in recent times. I used several protocols for this review. I followed different methods for data collection among them, Google Scholar, Scopus, PubMed, etc. And I collected data from different research papers. There are 11th Bangladeshi Medicinal Plants are described in this review paper and they have shown anticancer effects.

Chapter 1: INTRODUCTION

1.1 Cancer

Cancer is a devastating disease caused by abnormal cell growth and can also be caused by various genetic changes. It can attack any part of the body. When cancer occurs, the cells get out of control and the bad cells attack the healthy cells and the cancer spreads. An irreversible process is currently developing in the world for cancer treatment. Which will prevent body cells from multiplying and prevent the growth of cancer. It is a threat to the public health of the world. Cancer cells usually surround normal cells and spread throughout the body via the blood vessels and lymphatic system to metastasize.^[3]

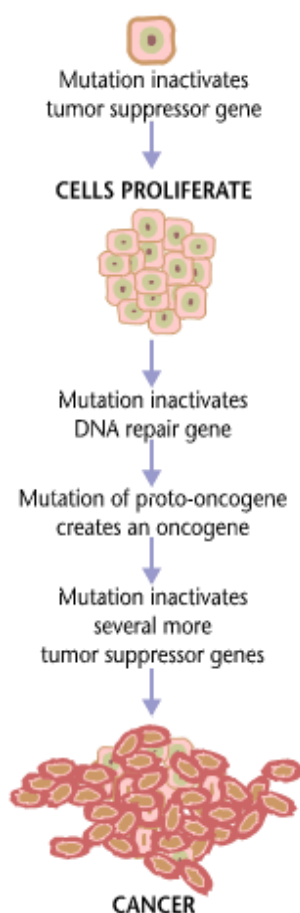
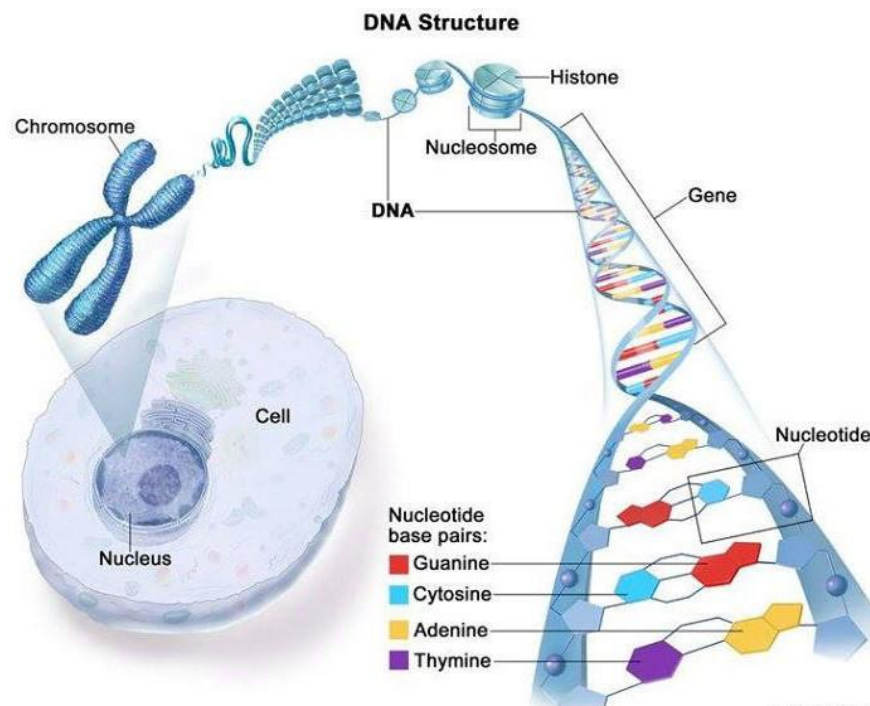


Figure 1: Mutation of cells

1.2 Cancer Development

Cancer can be hereditary it is caused by the flow of the day which prevents the cells from growing properly. Cancer can be caused by genetics and causes:^[4]

- Due to cell division
- DNA damaged by hazardous substances
- Due to excessive use of smoking
- Effect of the UV rays
- Due to genes inherited from parents



Cancer is caused by heredity and certain mutations in basic physiological single genes. Genes are tightly bound to the DNA helix by the chromosomes.^[5]

Figure 2: Cancer development

1.3 Types of cancer:

National cancer institute permits the ordinary types:

➤ **Bladder Cancer**

Common symptoms of bladder cancer are rectal discharge from the bladder and blood in the urine. Smoking is the biggest risk factor for bladder cancer.^[6]

➤ **Breast cancer:**

The usual symptoms of breast cancer are cells growing out of control. There are several types of breast cancer. It can be started anywhere in the breast. Most of breast cancer occurs in women over the age of 50.

➤ **Endometrial cancer:**

Endometrial cancer is a type of cancer in which cancer cells form in the tissue of the endometrium. Endometrial is a cancer of the uterus. It is more likely to affect women, who are overweight or obese.^[7]

➤ **Thyroid cancer:**

Thyroid cancer is where cancer cells form in the tissue of the thyroid gland. This Cancer can be of various types. It is common for gender age, and radiation exposure to increase the risk of cancer.

➤ **Lung cancer:**

Lung cancer usually arises from lung tissue and its cells are associated with the airways. This cancer increases the risk of death in both men and women.^[8]

➤ **Kidney cancer:**

Cancer occurs when cell division in the kidney goes out of control. Common symptoms of kidney cancer are flank pain, high blood pressure blood in urine, etc. The main treatment for kidney cancer is surgery and chemotherapy.^[9]

➤ **Melanoma cancer:**

Melanoma is the most aggressive skin cancer with an increased risk of death. It can be cured if detected early. It is more common in young men and women under the age of 30.^[10]

1.4 Cause of cancer:^[11]

- Benzene and unlike chemical
- Drinking excessive alcohol

- Smoking
- Environmental poisons such as- some toxic mushrooms and aflatoxins
- Exorbitant sun exposure
- Heritable problems
- Fattiness
- Radiation
- Viruses
- Lifestyle
- Hormones
- Infection and inflammation
- Immunosuppression

1.5 Symptoms of cancer:^[12]

Cancer symptoms depend on their various types. The symptoms are:

- Fatigue
- Weight loss
- Pain
- Skin modification
- Unusual bleeding
- Patient cough
- Fever
- Abnormal ages of pelvic pain. Maximum females retain the occasional anomalous menstruation
- Changes in bathroom habits
- Bloating
- Bone changes
- Habitual coughing
- Habitual headache
- Difficulty swallowing
- Extreme bruising

Chapter 2: TREATMENT

2.1 Cancer is treated by:^[13]

- Surgery
- Chemotherapy
- Radiation Therapy
- Biologic or Targeted therapy
- **NATURAL PRODUCTS (MEDICINAL PLANTS)**

2.2 Role of medicinal plants in cancer treatment:

- WHO estimates that 80% of people are dependent on medicinal plants for primary care of the world.^[14]
- Safer
- More Natural
- Holistic
- Symptom relief
- Less toxicity
- Less expensiveness

2.3 Medicinal plant use of cancer treatment:

- All over the world cancer is one of the most humorless health cases that affect the continuance and quality of the existent's life.
- As the prevalent medicinal arrangements dissatisfy to precisely fill the major conditions for prosperous cancer therapy. The use of naturally elaborated anticancer agents has developed as an indispensable safe, low cost and accessible one.^[15]
- Thus, the use of plant excerpts with implicit anticancer medicinal effects might be especially expressive.
- A lot of therapeutic plants, traditionally applied for thousands of periods, are current in a batch of herbal medications of the fitness care suggested for their intriguing antioxidant and anticancer conditioning.

- The national cancer institute has collected 15000 plants samples from 15 countries and 100000 plants concepts.^[16]
- In Bangladesh more than 100 medicinal plants cultivated and various classifications have been reported in laboratories for their anticancer properties.
- Deficient types of medicinal plants are used to prevent cancer, among them Vinblastine, vincristine, gallic acid, gingerly -6, etc.
- various medicinal plants in Bangladesh act as different agents in cancer prevention and I think this study will increase the interest of students.

Chapter 3: MEDICINAL PLANT

The medicinal plant is a plant that we use in the primary treatment of various diseases. It works as an effective medicine for various diseases. Currently, studies have shown that medicinal plants have fewer side effects than other medications and are considered suitable for health. Since Bangladesh is an eco-friendly country a large number of medicinal plants are produced here. If we can use this medicinal plant properly it will play a leading role in cancer treatment.^[17]

3.2 Medicinal plant and Anticancer agents:

Some medicinal plants are described below which play a role in cancer prevention:^[18]

Table 1: The therapeutic potential of plants leaf extract

Sl No	Plant name	Chemical compound	Target organ	Mechanism of action
01	Azadirachta indica	Azadirachtin, Gedunin, Nimbin, Nimbidin, Beta-sitoste	Breast	Modulation of cellular accumulation, isolation, apoptosis, angiogenesis, and metastasis procedure.
02	Brassica oleracea	Sulforaphane	Prostate	Cell cycle arrest, cell cycle inhibition,
03	Cinnamomum tamala	Bornyl acetate, Caryophyllene oxide	Colon	DNA affliction degraded prostatic blowup and enriched hypertension.
04	Datura metel	Steroidal lactones-withonilidies	Breast	Neoplasm cell apoptosis, the ethanol extract of the breaks had towering anticancer exertion than the steam extract.

05	Hibiscus rosa-sinensis	Riboflavin, Niacin, Margoric Acid, Lauric acid	Leukemia	Hibiscus extract was suitable to specifically induce apoptosis in both tripartite adversary and estrogen receptor-favorable breast cancer cells.
06	Hyptis suaveolens	Sabinene, Beta-caryophyllen, Spatulenol	Prostate	Cell cycle arrestment.
07	Mangifera indica	Mangiferin	colon	The natural trace ordinarily involves amplified permeability of the mitochondrial membrane and the discharge of cytochrome C to drive the generator.
08	Psidium guajava	Ascorbic acid, Apigenin	Prostate	Determination of apoptosis covers ribosomal p70s6 kinase.
09	Withania somnifera	Withaferin A	Lung	Inhospitable aftereffect.
10	Senna occidentalis	Tannins	Blood cell	Deduction of apoptosis.

Table 2: The therapeutic potential of plants root and another extract:

Sl NO	Plant Name	Chemical compound	Target organ	Mechanism of action
01	Asparagus racemosus	Steroidal saponins	Lung	Asparagus racemosus origin extract can beget cytotoxic goods, modify the morphology and bring

				accessory constraint in A549 cells.
02	Averrhoa carambola	Flavonoid-AC1	Prostate	ACE treatment brings out the expressive reduction in lipid peroxidation.
03	Curcuma longa	Curcumin	Cervical	Anti-neoplastic extraction, the capability of curcumin to spark protein kinase D1.
04	Psidium guajava	Lycopene	Prostate	Determination of apoptosis covers ribosomal p70S6 kinase.
05	Punica granatum	Pomegranate tannin	Prostate	Antipathetic aftereffect, Pomegranate inhibits CYP exertion.
06	Syzygium aromaticum	Betulinic acid	Blood cells	The antiproliferative issue covers bitchy carcinoma in harborage suspended.
07	Tagetes erecta	Quercetagenin, patuletin	Breast	Mitochondrial apoptosis controls thymidylate synthase causing DNA and RNA applications.
08	Tamarindus indica	Polysaccharide PST001	Blood cells	Determination of apoptosis. In vitro goods of seeds methanolic extract on two cancer cell ranges.
09	Withania somnifera	Withanolides	Lung	Unsympathetic issue.

3.3 *Azadirachta indica*

Azadirachta indica is commonly known as “Neem” in Bangladesh. It belongs to the family of Meliaceae. Every part of this plant has medicinal importance. This plant mainly consists of various active compounds like Nimbin, nimbidin, nimbidol, nimbolide, etc. These compounds play a role in cancer prevention by acting as anti-cancer antioxidants and inhibiting the proliferation of scattered cells.^[19]

This discussion mainly discusses the anti-cancer properties of *Azadirachta indica*. The active constituents of neem have preventive and protective effects against cancer. After all, neem plays an active role in preventing cancer.^[20]

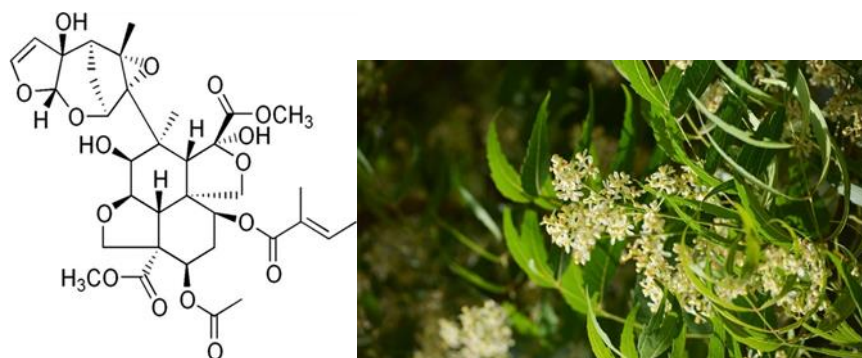


Figure 3: *Azadirachta indica* (neem)

3.4 *Phyllanthus emblica*

Phyllanthus Emblica is commonly known as “Amlaki” or “Amla” in Bangladesh. It is a medium-sized plant with compound leaves and bears small or medium size greenish-yellow fruits. The plant is found in different regions of Bangladesh and grows naturally. It contains various active chemical compounds, notable among them are ellagic acid, tannins, gallic acid, lipids, umbilical, etc. *Phyllanthus emblica* is a medicinal plant and is widely used for its medicinal properties, for example, the fruit extract of the plant is traditionally used in medicinal production. It is used for everything from constipation to treating tumors.^[21] *Phyllanthus emblica* extract has long played a role in cancer treatment and helps in the prevention of harmful aspects of cancer. Aqueous extracts of this plant exhibit cytotoxic activity against ovarian and cervical malignant cells and help suppress the growth of cancerous tumors.

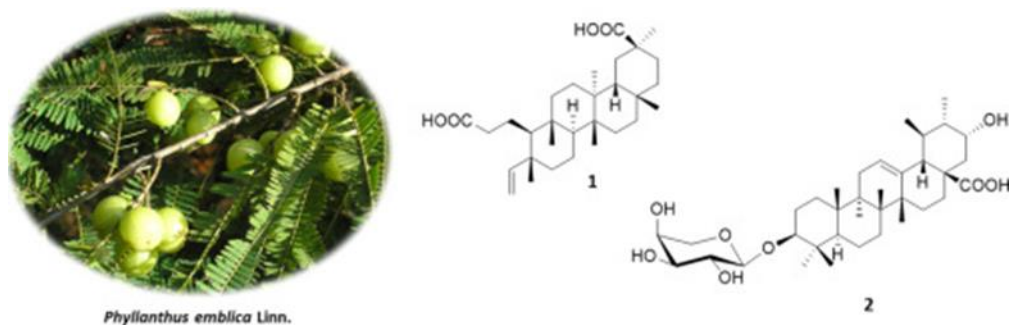


Figure 4: Phyllanthus emblica (amloki)

3.5 Terminalia chebula

Terminalia chebula is commonly known as “Haritaki” in Bangladesh. It grows and grows naturally in various parts of Bangladesh. This plant contains various active chemical components, among them amino acids, flavonoids, glycosides, resins, minerals, demoting sugars, tannins, steroidal triterpenoids, etc. These active ingredients play an effective role in preventing cancer and protecting the harmful aspects of cancer. The alcoholic extract of *Terminalia chebula* fruit plays an effective role in inhibiting the growth of breast cancer cells. Moreover, this plant is used in the treatment of indigestion, constipation, dysentery, etc.^[22]

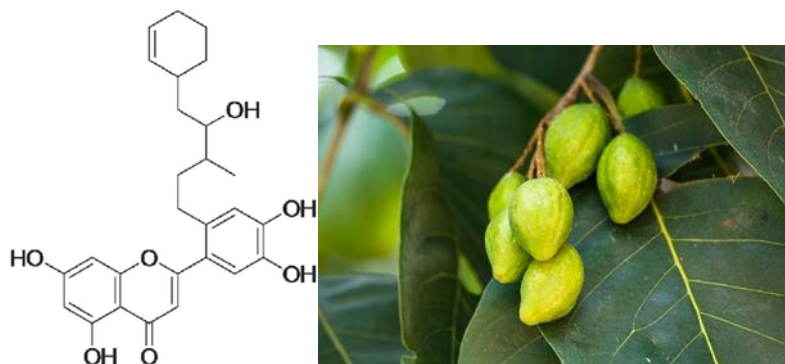


Figure 5: Terminalia chebula (hartaki)

3.6 Withania somnifera

Withania somnifera is commonly known as “Ashwagandha” in Bangladesh and it is also grown in the northern part of Bangladesh. It belongs to the Solanaceae family. This plant contains various chemical compounds called tropane alkaloids, steroidal lactones, and withanolides. This plant plays a role as Ayurvedic medicine in cancer treatment and it is used as a conventional medicine to fight cancer. The extracts of this plant are

tropine, pseudo tropine, tigloyloxytropine, choline, anaferine, somniferous, somniferinine, etc.^[23] Extracts of this plant have been used in in-vitro studies to inhibit the progression of human lung, breast, and colon cancer cells and resemble doxorubicin as a common drug.

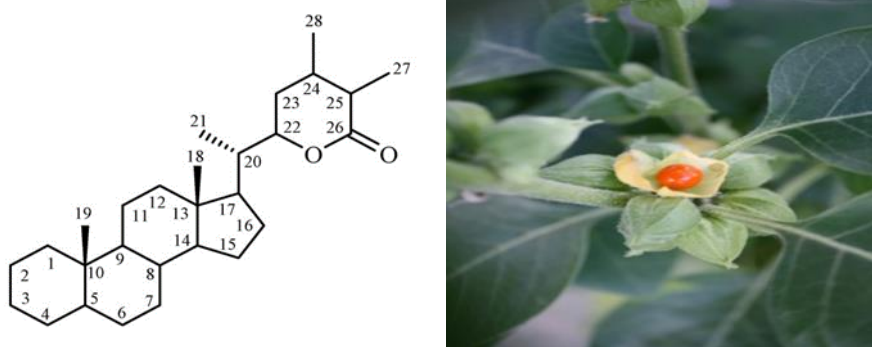


Figure 6: Withania somnifera (Ashwagandha)

3.7 Zingiber officinale

Zingiber officinale is known as “ADA” in Bangladesh. It enhances food quality and is widely used worldwide as a spice. Zingiber officinale contains an active phenolic amalgam called gingerol-6 which is very important in fighting cancer. Gingerol-6 has two cancer conditioning modes that inhibit cancer cell growth and inhibit cancer development and it is also effective in reducing the cholesterol function of human cells. Ginger extract is used as chemotherapy in cancer treatment.^[24]

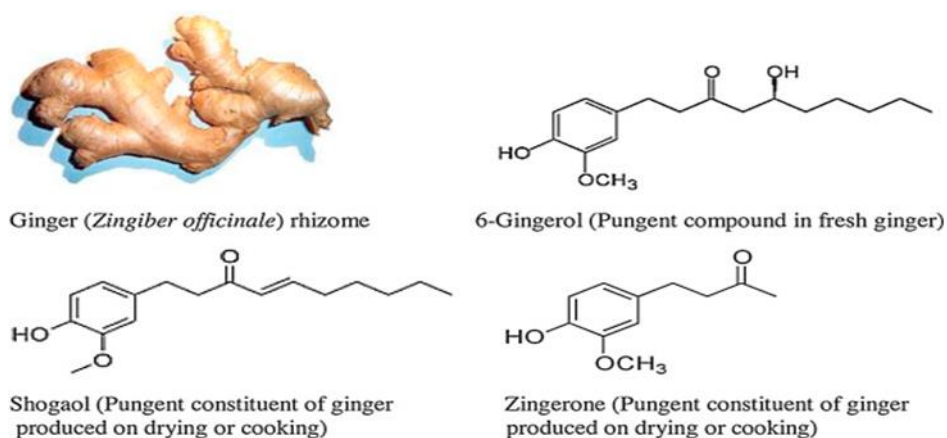


Figure 7: Zingiber officinala (ada)

3.8 Allium Sativum

Allium sativum is commonly known as “Rashoon” in Bangladesh and belongs to the Liliaceae family. Generally, this plant is a combination of chemical compounds with multiple uses. It is commonly used in the treatment of chromatid type of cancer and the anti-cancer agent allicin extracted from the plant acts as an anti-cancer agent. This chemical compound called allicin is fully metabolized in the cell chamber and liver and destroys cancer cells.^[25]

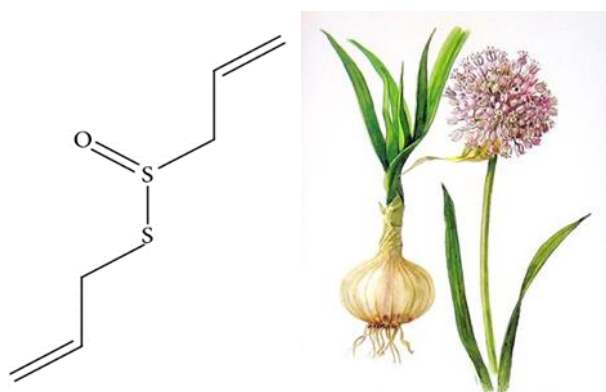


Figure 8: Allium sativum (Rashun)

3.9 Nigella sativa

Nigella sativa is locally known as black cumin in Bangladesh and acts as a long-lasting fragrance. Black cumin is one of the most living ingredients are carvacrol, thymoquinone, thymohydroquinone, thymoquinone, nigellone-N-oxide, nigericin, nigellone, thymol, and alpha-herein. Sativa seed living composites and alpha-herein destroy cancerous cells within neoplasms.^[26] Thymoquinone is an anti-cancer agent that inhibits the secretion of colon cancer cells by affecting morphological changes and accelerating cancer cell apoptosis.



Figure 9: Nigella sativa (Kalojiraa)

3.10 Cannabis sativa

Cannabis sativa is originally known as “Gaza” which belongs to the Cannabaceae family. The plant reduces the risk of breast cancer and eliminates cancer growth. Cannabinoids are the main active constituents of cannabis sativa that inhibit the growth of lung adenocarcinoma cells by inhibiting cancer formation. These plant composites exhibit anti-tumor potency in cells and likewise act as anti-cancer agents in cells.^[27]

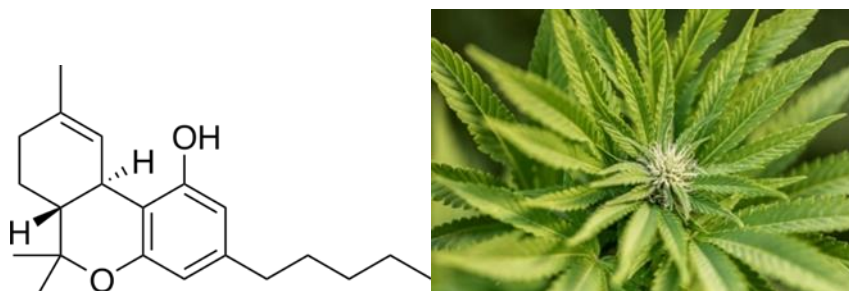


Figure 10: Cannabis sativa (Gaza)

3.11 Camellia sinensis

Camellia sinensis is one of the most common plants around the world which is mainly known as “tea”. Camellia sinensis contains gallate, epicatechin-3, epicatechin, epigallocatechin, and polyphenolic compounds that act mainly as alcoholic agents.^[28] This plant also contains various clinical components such as chlorogenic acid, carotenoids, triallyl glucose, quinic acids, lignin, protein, chlorophyll, caffeine, etc which play a very important role in the treatment of cancer.^[29]

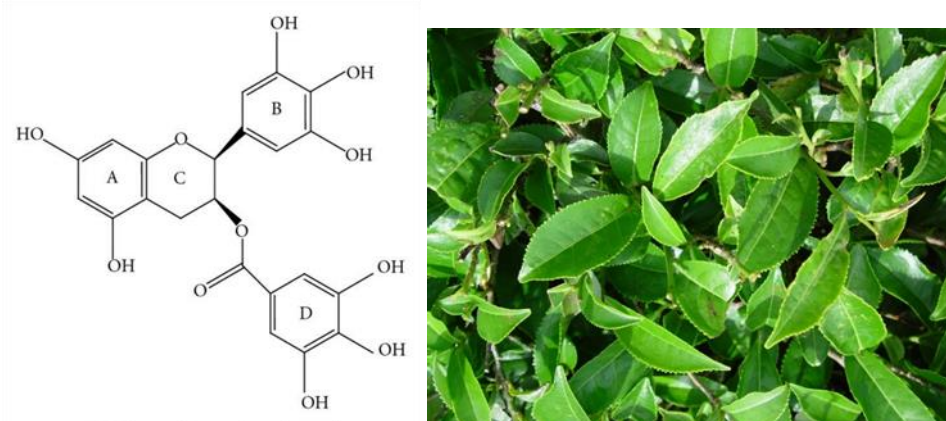


Figure 11: Camellia sinensis (Tea)

3.12 Hibiscus rosa-sinensis

Hibiscus rosa-sinensis is an ornamental medicinal plant native to various parts of Asia. This plant contains alkaloids, tannins, flavonoids, saponins, terpenoids, essential oil, and polyphenolic chemical compound. Hibiscus rosa-Sinensis extract acts as a triple negative anti-cancer agent that reduces the risk of breast cancer and accelerates the growth of breast cancer. A study has shown that the flower extract of this plant can prevent triple-negative breast cancer and is much more harmful than normal cancer cells.^[30]

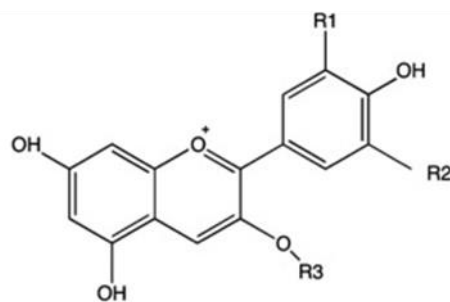


Figure 12: Hibiscus rosa-sinensis (joba)

Chapter 4: Discussion

A large number of medicinal plants are found in Bangladesh that exhibit anti-cancer properties and help prevent cancer. Chemotherapy is mainly used in cancer treatment and it has various side effects like nausea, hair loss, fatigue, diarrhea, neuropathy, etc. This process is very expensive and difficult for cancer treatment. In such a situation, one of the beneficial measures in cancer treatment is the use of medicinal plants. The use of medicinal plants is very accessible and convenient and has no side effects as compared to other medicines. This review describes various anticancer medicinal plants that play a very active role in cancer prevention.

Chapter 5: Conclusion

Medicinal plants are used as the main means of cancer treatment as well as the main raw materials for manufacturing ultra-modern drugs. Medicinal plants are an essential part of cancer treatment. Bangladesh is an agricultural country and has a variety of medicinal plants that have been experimentally used as medicine to prevent cancer. This study discusses the proper use of medicinal plants in cancer relief and it is hoped that one day this medicine will play an effective role in eradicating cancer.

<p>Chapter 6:</p> <p>REFERENCES</p>

1. Kundosn AG. Two genetic hits to cancer. Nature reviews. Cancer 2001-1-157-62. Doi: 10.1038/35101031.
2. Korkina I, Kostyuk V. Biotechnologically produced secondary plant metabolites for cancer treatment and prevention. Current pharmaceutical biotech. 2012;13(1):265-275. Doi: 10.2174/138920112798868692.
3. Ghani A. Medicinal plants of Bangladesh with chemical constituents and uses. Asiatic society of Bangladesh, Dhaka 2003, 196-197.
4. Shoeb M. Cytotoxic compounds from the Genus Centaurea. PhD thesis. Aberdeen, UK, The Robert Gordon University 2005. Doi: 10.3329/bio.v1i2.486.
5. Franklin BD, Seedat H, Heinrich M, Use of herbal remedies by patients admitted to hospital, Pharma World Sci 2007, vol 29.
6. Armitage P. A note on the time homogeneous birth process. Journal of the Royal Statistical Society, Series B 1953-15-90-91
7. Armitage P and Doll R 1961. Stochastic models for carcinogenesis. In Neyman J, ed, Proceedings of the fourth Berkeley Symposium on Mathematical Statistics and Probability, pp. 19-38. University of California Press Berkeley.
8. Armitage P, Doll R. A two-stage theory of carcinogenesis in relation to the age distribution of human cancer. British Journal of Cancer. 1957-11-161-169.
9. Ashley D. J. Colonic cancer arising in polyposis coli. Journal of Medical Genetics. 1969a: 6: 376-378.
10. Ashley D. J. The two hit and multiple hit theories of carcinogenesis. British Journal of Cancer 1969b:23:313-328.
11. Bach S.P, Rehman A.G, Potten C. S. Stem cells: the intestinal stem cell as a paradigm. Carcinogenesis. 2000;21:469-476.
12. Bapat, S. A 2006. Evolution of cancer stem cells. Seminars in Cancer Biology [doi:10.1016/semcancer.2006.05.001].
13. Barbicid M. Ras genes. Annual Review of Biochemistry. 1987-56-779-827.

14. Barton N.H, Keightley P.D. understanding quantitative genetic variation. *Nature reviews genetics*. 2002;3:11-21.
15. Backman R. A. Genetic instability in cancer. Theory and experiment. *Seminars in cancer biology* 2005-15-423-435.
16. Berenbium I. the cocarcinogenic action of croton resin. *Cancer research*. 1941;1:44-48.
17. Berenbium I, Shubik P. a new, quantitative approach to the study of stages of chemical carcinogenesis in the mouses skin. *British journal of cancer*. 1947a;1:383-391.
18. Bernstein C, Bernstein H, Payne C. m, garewal H. DNA repair/pro- apoptotic dual-role proteins in five major DNA repair pathways: fail-safe protection against carcinogenesis. *Mutation research* 2002;511:145-178.
19. Berwick M, Vineis P. Markers of DNA repair and susceptibility to cancer in humans: an epidemiological review. *Journal of the National Cancer Institute*. 2000-92:874-897.
20. De A, Papiasian C, Hentges S, Banerjee S, Haque I, Banerjee SK. *Emblica officinalis* extract induces autophagy and inhibites human ovarian cancer cell proliferation, angiogenesis, growth of mouse xenograft tumors. *PLoS one*. 2013;8(8) doi: 10.1371/journal.pone.0072748.e72748.
21. Ferry DR, Smith A, Malkjandi J et al, phase I clinical trail of the flavonoid quercetin: pharmacokinetics and evidence for in vivo tyrosine kinase inhibition, *Clinical cancer research* 2(4):659-668.
22. Ahuja R, Agrawal N, Mukerjee A. evaluation of anticancer potential of *Terminalia chebula* fruits against Ehrlich Ascites Carcinoma induced cancer in mice. *JSIR* 2013;2(3):549e554.
23. Saleem M, Hushum M, Harkonen P, Pihlaja K. inhibition of cancer cell growth by cured extract and phenolics of *Terminalia chebula* fruit. *Journal of Ethnopharmacology* 2002;81:327. Doi: 10.1016/s0378-8741(02)00099-5.
24. Javaprakasam B, Zhang Y, Seeram N, Nair M. growth inhibition of tumor cell line by withanolides from *Withania somnifera* leaves. *Life sciences* 2003; 74(1):125. Doi: 10.1016?j. 1fs.2003.07.007.
25. Uddin SJ, Nahar L, Shilpi JA, Shoeb M, Borkowski T, Gibbons S et al. Gedunin a limonoid from *Xylocarpus granatum*, inhibits the growth of CaCo-2 colon

- cancer cell line. In vitro Phytother. Res 2007-21-757-761. Doi:10.1002/ptr.2159.
26. Kamath SG, Chen N, Xiong Y, Wenham R, Apte S, Humphrey M et al. Grdunin a novel natural substance, inhibits ovarian cancer cell proliferation. Int J. gynecol cancer 2009-19-1564-1569. Doi: 10.1111/IGC.0b013e3181a83135.
 27. Sharma C, vas A, goala P. Gheewala TM, Rizvi TA, Hussain A. Ethanolic neem leaf extract prevents growth of MCF-7 and HeLa cells and Potentiates the therapeutics index of cisplatin J. oncol, 2014, 321754.doi: 10.1155/2014/321754.
 28. Bettuzzi S, Brusi M, Rizzi F, Castagnetti G, peracchia G, corti A. chemoprevention of human prostate cancer by oral administration of green tea catechins in volunteers with high-grade prostate cancer. Principle study cancer res 2006;66:1234-40 doi: 10.1158/008-5472. CAN-05-1145
 29. Edeoga HO, Okwu DE, Mbaebie BO. Phytochemical constituents of some Nigerian medicinal plants. African journal of biotechnology 2005;4(7):685-8.doi:10.5897/ajb2005.000-3127.
 30. Ochani PC, D Mello P. antioxidant and antihyperlipidemic activity of Hibiscus sabdariffa linn. Leaves and calyces extracts in rats. India J Exp Biol. 2009;47(4):276-82.