



**SEEDS USED IN THE TREATMENT OF CANCER**

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**ABSTRACT**

Cancer is a broad term. It describes the disease that results when cellular changes cause the uncontrolled growth and division of cells. Some types of cancer cause rapid cell growth, while others cause cells to grow and divide at a slower rate. Certain forms of cancer result in visible growths called tumors, while others, such as leukemia, do not. Most of the body's cells have specific functions and fixed lifespans. While it may sound like a bad thing, cell death is part of a natural and beneficial phenomenon called apoptosis. A cell receives instructions to die so that the body can replace it with a newer cell that functions better. Cancerous cells lack the components that instruct them to stop dividing and to die. As a result, they build up in the body, using oxygen and nutrients that would usually nourish other cells. Cancerous cells can form tumors, impair the immune system and cause other changes that prevent the body from functioning regularly. Cancerous cells may appear in one area, then spread via the lymph nodes. These are clusters of immune cells located throughout the body.

**KEYWORDS:** Most of the body's cells have specific functions and fixed lifespans.

**INTRODUCTION**

- Cancers are a large family of diseases that involve abnormal cell growth with the potential to invade or spread to other parts of the body. They form a subset of neoplasms. A neoplasm or tumour is a group of cells that have undergone unregulated growth and will often form a mass or lump, but may be distributed diffusely.
- All tumour cells show the six hallmarks of cancer. These characteristics are required to produce a malignant tumour. They include.
- Cell growth and division absent the proper signals.
- Continuous growth and division even given contrary signals.
- Avoidance of programmed cell death.
- Limitless number of cell divisions.
- Promoting blood vessel construction.
- Invasion of tissue and formation of metastases.
- The progression from normal cells to cells that can form a detectable mass to outright cancer involves multiple steps known as malignant progression.<sup>[1]</sup>

**Signs and symptoms**

Symptoms of cancer metastasis depend on the location of the tumour.

When cancer begins, it produces no symptoms. Signs and symptoms appear as the mass grows or ulcerates. The findings that result depend on the cancer's type and location. Few symptoms are specific. Many frequently occur in individuals who have other conditions. Cancer can be difficult to diagnose and can be considered a "great imitator."

People may become anxious or depressed post-diagnosis. The risk of suicide in people with cancer is approximately double.

**Causes**

The majority of cancers, some 90–95% of cases, are due to genetic mutations from environmental and lifestyle factors. The remaining 5–10% are due to inherited genetics. Environmental refers to any cause that is not inherited genetically, such as lifestyle, economic, and behavioural factors and not merely pollution. Common environmental factors that contribute to cancer death include tobacco (25–30%), diet and obesity (30–35%), infections (15–20%), radiation (both ionizing and non-ionizing, up to 10%), lack of physical activity, and pollution. Psychological stress does not appear to be a risk factor for the onset of cancer, though it may worsen outcomes in those who already have cancer.

### Diagnosis

- **Physical exam.** Your doctor may feel areas of your body for lumps that may indicate a tumor. During a physical exam, he or she may look for abnormalities, such as changes in skin color or enlargement of an organ, that may indicate the presence of cancer.
- **Laboratory tests.** Laboratory tests, such as urine and blood tests, may help your doctor identify abnormalities that can be caused by cancer.
- **Imaging tests.** Imaging tests allow your doctor to examine your bones and internal organs in a noninvasive way.
- **Biopsy.** During a biopsy, your doctor collects a sample of cells for testing in the laboratory. There are several ways of collecting a sample.

### Cancer stages

Once cancer is diagnosed, your doctor will work to determine the extent (stage) of your cancer. Your doctor uses your cancer's stage to determine your treatment options and your chances for a cure.

Staging tests and procedures may include imaging tests, such as bone scans or X-rays, to see if cancer has spread to other parts of the body.

### Treatment

Many cancer treatments are available. Your treatment options will depend on several factors, such as the type and stage of your cancer, your general health, and your preferences. Together you and your doctor can weigh the benefits and risks of each cancer treatment to determine which is best for you.

### Cancer treatments

- **Surgery.** The goal of surgery is to remove the cancer or as much of the cancer as possible.
- **Chemotherapy.** Chemotherapy uses drugs to kill cancer cells.
- **Radiation therapy.** Radiation therapy uses high-powered energy beams, such as X-rays, to kill cancer cells.
- **Bone marrow transplant.** Bone marrow transplant is also known as a stem cell transplant. Your bone marrow is the material inside your bones that makes blood cells.
- **Immunotherapy.** Immunotherapy, also known as biological therapy, uses your body's immune system to fight cancer. Cancer can survive unchecked in your body because your immune system doesn't recognize it as an intruder. Immunotherapy can help your immune system "see" the cancer and attack it.
- **Hormone therapy.** Some types of cancer are fueled by your body's hormones. Examples include breast cancer and prostate cancer.
- **Targeted drug therapy.** Targeted drug treatment focuses on specific abnormalities within cancer cells that allow them to survive.

- **Clinical trials.** Clinical trials are studies to investigate new ways of treating cancer. Thousands of cancer clinical trials are underway.

### Seeds used in the treatment of cancer

The different seeds used in the treatment of cancer are

1. Flax seeds
2. Apricot seeds
3. Black seeds
4. Papaya seeds
5. Pumpkin seeds
6. Colchicum seeds

#### 1. Flax seeds

Flax (*Linum usitatissimum*) also known as common flax or linseed, is a member of the genus *Linum* in the family *Linaceae*. It is a food and fiber crop cultivated in cooler region of the world. Textiles made from flax are known in the western countries as linen, and traditionally used for bed sheets, underclothes, and table linen. Its oil is known as linseed oil. In addition to referring to the plant itself, the word "flax" may refer to the unspun fibers of the flax plant. The plant species is known only as a cultivated just once from the wild species *Linum bienne*, called pale flax.

#### Synonyms

- *Linum crepitans* (Boenn) Dumort
- *Linum humile* Mill
- *Linum indehiscens* (Neilr) Vavilo & Elladi

#### Biological source

It consists of the dried fully ripe seeds of *Linum usitatissimum* Linn. Belonging to the family *Liliaceae*.

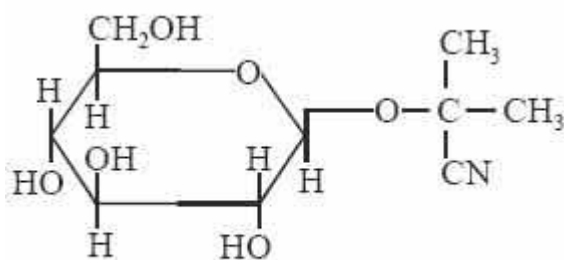
#### Geographical source

It is cultivated extensively as a source of fibers in Algeria, Egypt, Greece, Italy, and Spain; as a source of oil in Afghanistan, India and Turkey and in Russia (now CIS-countries) for both oil and fiber. It is also found in several temperate and tropical zones.

#### Chemical Constituents

The ripe seeds of linseed contain small quantities of a cyanogenetic glycosides known as linamarin (or phaseolunatin) as given below.

Interestingly, **linamarin** evolved HCN with linseed meal only but not with emulsion. However, pure linamarin is a bitter needle like crystalline substance. It is freely soluble in water, cold alcohol, hot acetone, slightly in hot ethyl acetate, ether, benzene, chloroform and practically insoluble in petroleum ether.



Linamarin

Besides, linseed seeds comprise of fixed oil (33-43%) mucilage present in testa (6%), proteins (25%) and an enzyme called *linase*.

**Linamarin** upon enzymatic hydrolysis yields HCN which actually renders the seeds highly poisonous.

#### Chemical Test

The mucilage of linseed seed gives a distinct red colour on being treated with Ruthenium Red Solution.

#### Uses

1. Therapeutically, the linseed oil is mostly recommended for the external applications only; liniments and lotions.
2. It is employed in the treatment of scabies and other skin disease in combination with pure flowers of sulphur.
3. As the linseed oil has an inherent very high 'iodine value' it is used mostly in the preparation of non staining 'Iodine Ointment' and several other products such as: 'Cresol with Soap'.
4. Commercially, it is one of the most important 'drying oil'; and, therefore, substantially huge amounts are exclusively used for varnishes and paints.
5. Linseed oil finds its extensive application in the manufacturer of soap, grease, polymer, plasticizer, polish and linoleum.

## 2. Apricot seeds

Apricot kernels are sometimes added to soaps or scrubs as an exfoliant.

In 1993 the New York State Department of Agriculture and Markets tested the cyanide content of two 220 gram (8 oz) packages of bitter apricot k An apricot kernel is the seed of an apricot, which is located within the hard endocarp, and together they form the or *stone* or *pit*. It is known for containing amygdalin, a poisonous compound. Together with the related synthetic compound laetrile, amygdalin has been marketed as an alternative cancer treatment. However, studies have found the compounds to be ineffective in the treatment of cancer, as well as potentially toxic or lethal when taken by mouth, due to cyanide poisoning.

#### Synonym.

- *Amygdalus communis amara*
- *Prunus dulcis amara*

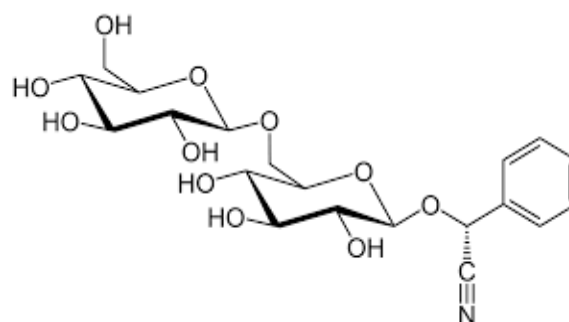
- *Prunus armeniaca*
- *Amygdalus armeniaca*
- *Armeniaca ansu kostina*

#### Geographical source

It is cultivated in Persia since antiquity. Most of the modern American production of apricot comes from the seedling carried to the west coast by Spanish missionaries. Today apricot cultivation has spread to all parts of the globe having climate that can support its growth needs.

#### Chemical composition

The chemical composition of the bitter and sweet varieties of apricot (*prunus armeniaca*) kernel was investigated oil, proteins, soluble sugar, fibers, (NDF and ADF), and ash contents in kernels were determined. Sweet apricot kernels were found to contain more oil (51g/100g) and less soluble sugar (7 g /100g) than bitter kernel(43 and 14 g/100 g, respectively). No significant differences in the protein content were found in either variety. Oleic acid and linoleic acid are approximately 92g/100 g of total fatty acids. Pectic polysaccharides, cellulose, and hemicelluloses (in decreasing amount) were inferred to be their main component polysaccharides. Essential amino acids consists 32-34 g/100 g of the total amino acids determined. Amygdalin content was very high (5.5 g/100 g) in bitter cultivars and was not detected in the sweet variety.



#### Uses

- Apricot kernels may have some health benefits, and some people have suggested that they may help fight cancer
- Apricot Seeds are Rich in Fiber, which Supports Digestive Health
- Apricot Seeds Contain Thiamine and Omega-3 Fatty Acids, which May Lower Blood Pressure and Improve Heart Health
- Apricot Seeds May Reduce the Effects of Inflammation and Arthritis
- Zinc in Apricot Seeds May Support Vision and Eye Health
- Omega-3 Fatty Acids Found in Apricot Seeds May Support Mental Health
- Calcium Found in Apricot Seeds are Essential to Bone Health
- B17 and Zinc Found in Apricot Seeds May Ease Ear Pain

- Apricot Seed Oil is Widely Used to Support Skin Health
- Apricot Kernels Used to Support Respiratory Health

### 3. Black seeds

Black seed is a plant. People have used the seed to make medicine for over 2000 years. It was even discovered in the tomb of King Tut.

Historically, black seed has been used for headache, toothache, nasal congestion, and intestinal worms. It has also been used for "pink eye" (conjunctivitis), pockets of infection (abscesses), and parasites.

Today, black seed is used for treating digestive tract conditions including gas, colic, diarrhea, dysentery, constipation, and hemorrhoids. It is also used for respiratory conditions including asthma allergies, cough, bronchitis, emphysema, flu, swine flu, and congestion.

#### Synonyms

- Black cumin (English)
- *Black caraway seeds (USA)*
- Shonaiz (Persian)
- Kalajira (Bangali)
- *Nigella sativa*

#### Biological source

It is obtained from dried ripe seeds of *Bunium bulbocastanum* belonging to the family Ranunculaceae.

#### Geographical source

Black seeds is native to southern Europe, North Africa and South west Asia and it is cultivated in many countries in the word like Middle Eastern Mediterranean region, South Europe, India, Pakistan, Syria, Turkey, Saudi Arabia.

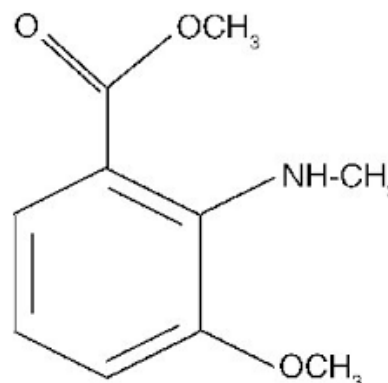
#### Chemical composition

Extensive studies were done to identify the composition of the black cumin seed, the ingredients of *N. sativa* seed includes: fixed oil, proteins, alkaloid, saponin and essential oil.

The fixed oil (32-40 %) contains: unsaturated fatty acids which includes: arachidonic, eicosadienoic, linoleic, linolenic, oleic, almitoleic, palmitic, stearic and myristic acid as well as beta-sitosterol, cycloeucaenol, cycloartenol, sterol esters and sterol glucosides (3-5).

The volatile oil (0.4-0.45 %) contains saturated fatty acids which includes: nigellone that is the only component of the carbonyl fraction of the oil, Thymoquinone (TQ), thymohydroquinone (THQ), dithymoquinone, thymol, carvacrol,  $\alpha$  and  $\beta$ -pinene, d-limonene, d-citronellol, *p*-cymene volatile oil of the seed also contains: *p*-cymene, carvacrol, t-anethole, 4-terpineol and longifoline.

Black cumin seed have two different forms of alkaloids: isoquinoline alkaloid that includes: nigellicimine, nigellicimine n-oxide and pyrazol alkaloid that includes: nigellidine and nigellicine.



#### Chemical test

1. **Test for alkaloid:** The samples are added with 3ml of picric acid saturated solution. samples giving yellow precipitate shows presence of alkaloid.
2. **Test for fixed oil:** On a clean filter paper add 2 drops of each sample. If it leaves a translucent spot then it is presence of fixed oil.
3. **Test for volatile oil:** All the samples are added with alcoholic solution are added with sudan III dye. If sample become red then volatile oil is present
4. **Test for tannins:** Add  $\text{FeCl}_3$  to all the sample yellow colour give hydrolyable tannin wher as green colour give condensed tannin.
5. **Test for flavanoid:** The sample as added with naoh solution producing yellow coloration on adding dilute acid if the mixture goes colourless then presence of flavonid is confirmed.

#### Uses

Today, **black seed** is used for treating digestive tract conditions including: Gas, Colic, Diarrhea, Dysentery, Constipation, Hemorrhoids.

It is also used for respiratory conditions including: Asthma, Allergies, Cough, Bronchitis, Emphysema, Flu, Swine flu, Congestion

#### 4. Papaya seeds

A **papaya** *in vitro* study shows that it will treat many **cancer** cell line and **papaya** physiochemical having anticancer activities. **Papaya** is rich in enzyme papain which is effective against **cancer**. Papain breaks down the fibrin **cancer** cell wall and protein into amino acid form. *Carica papaya* (family: Caricaceae) belongs to the fruits and vegetable class. It is highly abundant and is commonly known as pawpaw in Nigeria. It is an invaluable plant that is prevalent throughout tropical Africa and Nigeria is the third largest producer globally (FAO 2002). Practically every part of the plant is of economic value and its use ranges from nutritional to medicinal. The fruit are popularly used as desert or processed into Jam, puree or wine, while the green fruits

are cooked as vegetable (Matsuura et al., 2004; Ahmed et al., 2002; OECD, 2005). The seeds are medicinally important in the treatment of sickle cell diseases (Imaga et al. 2009), poisoning related disorder (Okeniyi et al., 2007). The leaf tea or extract has a reputation as a tumor destroying agent (Walter 2008).

#### Synonyms

- *Carica Papaya*
- *Casaba*
- *Edible fruit*
- *Gourd*
- *Honeydew*
- *Musk*
- *Nutmeg*
- *Pepo*

#### Geographical source

Major papaya producers are Brazil, Indonesia and India that export the fruit to many countries, including the United Kingdom.

#### Chemical composition

The papaya seeds showed high concentrations of lipid (29.16%) and protein (25.63%). The high total lipid content found in papaya seeds may be considered economically attractive for industrial extraction, especially when compared to conventional oilseed crops such as corn and soybean which show a lipid content of 3.1-5.7 and 18-20%, respectively (O'Brien, 2004). Table 1 compares the results obtained in this study to those obtained previously by Marfo, Oke and Afolabi (1986) and Puangsri, Abdulkarim and Ghazali (2005).

#### Uses

Papaya has been used widely in folk medicine for many ailments: the juice for warts, corns, cancers, tumors, and thickened skin; the roots or their extracts for cancers of the uterus, syphilis, the tropical infection, hemorrhoids, and to remove mineral concretions in the urine; the unripe fruit as a mild laxative or diuretic, and to stimulate lactation, labor, or abortion; the ripe fruit for rheumatism and alkalizing the urine; the seeds for intestinal worms or to stimulate menstruation or abortion; the leaves as a poultice for nervous pains and elephantoid growths, or smoked for asthma relief; and the latex for psoriasis, ringworm, indigestion, or applied externally as an antiseptic or to heal burns or scalds, or applied to the cervix to contract the uterus.

#### 5. Pumpkin seeds

Pumpkins are gourd squashes of the genus *Cucurbita* and the family *Cucurbitaceae*. The pumpkin species available include *C. pepo* (called "Kuksuhobak" in Korean), *C. moschata* ("neulgeunhobak"), and *C. maxima* ("danhobak"). These three species are cultivated worldwide and have high production yields.

Pumpkins are cooked and consumed in many ways, and most parts of the pumpkin are edible, from the fleshy

shell to the seeds. In Korea, pumpkin flesh is consumed in soups and juices, or it is incorporated into various foods, such as rice cakes, candies, and breads. In the US and Canada, pumpkin is a Halloween and Thanksgiving staple. Pumpkin seeds and pumpkin seed oil are also commonly consumed in some countries.

#### Synonyms

- *Cucurbita*
- *Cucurbita pepo*
- *Cucurbita moschata*
- *Cucurbita maxicana*

#### Biological source:

It consists of the dried fully ripe seeds of *Cucurbita pepo* L. Belonging to the Family: *Cucurbitaceae*.

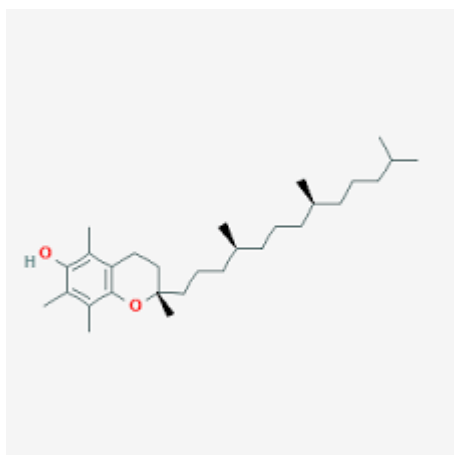
#### Geographical source

**Pumpkins**, like other squash, originated in northeastern Mexico and southern United States. The oldest evidence were **pumpkin** fragments dated between 7,000 and 5,500 BC found in Mexico.

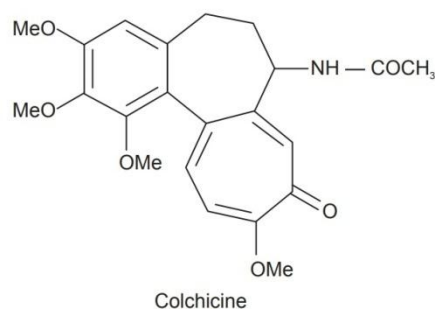
#### Chemical composition

The general chemical compositions and select bioactive components, including tocopherols, carotenoids, and  $\beta$ -sitosterol, were analyzed in 3 pumpkin species (*C. pepo*, *C. moschata*, and *C. maxima*) grown in Korea, and also in 3 parts (peel, flesh, and seed) of the pumpkin.

*C. maxima* had significantly more carbohydrates in the flesh than *C. pepo* and *C. moschata*. This high carbohydrate concentration may contribute to the sweet taste of *C. maxima*. Because of its sweet taste, *C. maxima* is called "Danhobak" in Korean, "Dan" meaning "sweet" and "hobak" meaning "pumpkin." The *C. maxima* flesh and peel had significantly more protein than *C. pepo* or *C. moschata*. *C. pepo* seeds had significantly more protein than *C. maxima* seeds ( $P < 0.05$ ). We found 20-25% more protein in the *C. pepo* seeds than reported in other studies, but 37-44% less protein than reported by Idouraine et al. We found 43.99-52.43% fat in the seeds, which is higher than the 24.2-45.1% reported for four *Cucurbita* species (*C. moschata*, *C. maxima*, *C. pepo*, and *C. argyrosperma*) grown in a common garden of Missouri, USA and the 22-35% reported in African *C. pepo*. *C. pepo* had the most moisture in all parts, and *C. maxima* had the lowest. The moisture contents in the current study were similar to previous reports for *C. maxima* (87.6%) and *C. moschata* (92.3%).



They also contain resin, called colchicoresin, fixed oil, glucose and starch.



### Uses

- Linked to a Reduced Risk of Certain Cancers
- Full of Valuable Nutrients
- High in Antioxidants
- Improve Prostate and Bladder Health
- Very High in Magnesium
- May Improve Heart Health
- Can Lower Blood Sugar Levels
- High in Fiber
- May Improve Sperm Quality
- May Help Improve Sleep
- Easy to Add to Your Diet

### 6. COLCHICUM

This plant alkaloid, derived from *Colchicum* species, has been used for centuries to treat gout but its tubulin-binding properties have made this compound a widely utilized tool in the study of microtubule dynamics. Colchicine binds directly to free tubulin in a 1:1 ratio, inducing a conformational change in the tubulin dimer (Roach *et al.* 1985); this binding is virtually irreversible. When a colchicine-bound tubulin dimer adds to the end of a growing microtubule, further elongation is inhibited; the polymer is destabilized and disassembles (Schliwa 1986).

### Synonyms

Autumn Crocus, Cigdem, Colquico, Meadow Saffron, Naked Boys, European Colchicum Seed.

### Biological Source

Colchicum consists of dried ripe seeds and corms of *Colchi-cum autumnale* Linn., belonging to family Liliaceae.

### Geographical Source

It is mainly found in Central and South Europe, Germany, Greece, Spain, Turkey and England.

### Chemical composition

The active principle is said to be an alkaline substance of a very poisonous nature called Colchicine. Besides colchi-cine, demecolcine and other alkaloids are present.

### Chemical Test

Colchicum corm with sulphuric acid (70%) or conc. HCl produces yellow colour due to the presence of colchicines.

### Uses

Both the corm and the seeds are analgesic, antirheumatic, cathartic and emetic. They are used mainly in the treatment of gout and rheumatic complaints, usually accompanied with an alkaline diuretic. Leukaemia has been successfully treated with autumn crocus, and the plant has also been used with some success to treat Bechet's syndrome, a chronic disease marked by recurring ulcers and leukaemia. A very toxic plant, it should not be prescribed for pregnant women or patients with kidney disease, and should only be used under the supervision of a qualified practitioner.

### CONCLUSION

Cancer is a deadly disease. There are many treatments cancer, apart from the allopathic treatment there many herbal and natural treatments of cancer. Few seeds used in the treatment of cancer are mention in the article.

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