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Basil (*Ocimum basilicum* L.) Plant is used for the Treatment of Cancer

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ABSTRACT

Basil is a widely recognized herb with historical significance in traditional medicine for centuries. Scientific research suggests basil as an anti-cancer agent. Basil's efficacy in preventing and treating cancer in humans has been proven. Basil has anti-cancerous properties due to compounds like eugenol, linalool, methyl eugenol, rosmarinic acid, apigenin, luteolin, carnosic acid and beta-sitosterol. These compounds have antioxidant, anti-inflammatory and anti-proliferative qualities. These compounds can protect cells hinder cancer growth and promote cancer cell death. Basil is generally safe and well tolerated. This substance is considered safe with few adverse effects. Further investigation is necessary to determine if basil is effective in preventing or treating cancer in humans.

Introduction:

(i). Basil used for centuries in traditional medicine

Basil is originating from Southeast Asia belongs to the mint family. It is well-known for its unique and sweet taste resembling licorice and is widely used in various culinary traditions such as Italian, Thai and Vietnamese cuisine.

(ii). Basil plant has been used in conventional medication

For centuries basil has been utilized in traditional medicine to address various ailments like stomach pain, diarrhea and high body temperature. It is also thought to possess properties that combat inflammation, oxidation, cancer and microbial activity.

(iii). Pharmacological properties of basil plant

Basil possesses various therapeutic characteristics. This substance is rich in antioxidants and has demonstrated abilities to reduce inflammation, combat bacterial infections and potentially prevent cancer. Basil has the potential to effectively address multiple ailments such as fever, colds, flu, headaches, stress, hypertension, diabetes, heart disease and cancer.

Sr. No	Properties of Basil Plant	Health Benefits of Basil Plant
1	Antioxidant activity of plant	Basil has anti-oxidants to protect cells from free radical damage
2	Anti-inflammatory activity of plant	Basil reduces inflammation in the body
3	Antimicrobial activity of plant	Basil fights bacteria, viruses and fungi with anti-microbial properties
4	Cancer inhibition activity of plant	Basil possesses potential cancer-preventive characteristics

(iv). Table No1: Health benefits of basil plant

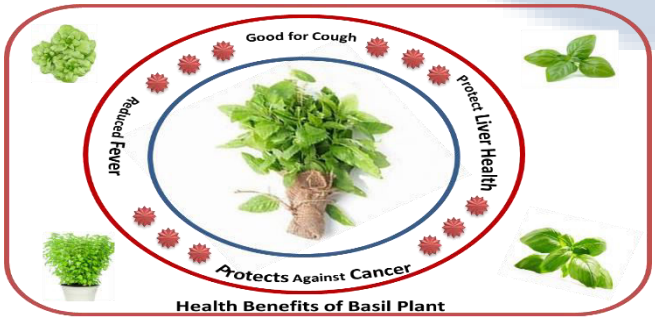

Figure 1: Health benefits of basil plants

(v). Basil shows potential anti-carcinogenic properties

Cancer is characterized by uncontrolled cellular growth but it possesses anti-tumorigenic qualities. The spreading of cancer cells to different areas of the body can cause significant health complications. Basil possesses promising qualities that may be utilized as an anti-cancer agent. To explain a study discovered that basil extract effectively impeded the growth of breast cancer cells when tested in laboratory conditions. It is generally believed that basil is safe for consumption but it is essential to consult your doctor before using it for medicinal reasons (1).

2. In vitro research of basil plant material

(i). Inhibit basil extracts of cancer cell growth in the test tubes

In laboratory experiments, test tubes are laboring as compact glass containers for cultivating cells. Cancer cells are cells that multiply uncontrollably. Cancer cells possess the capability to spread to various parts of the body, resulting in significant health challenges. To impede an action is to prevent it from happening. The assertion that basil extracts possess the capacity to inhibit the proliferation of cancer cells in test tubes implies that these extracts can hinder the growth of cancer cells within a controlled laboratory setting. It is essential to recognize that these tests were conducted with the use of test tubes, and further research is needed to determine the effectiveness of basil extracts in preventing or treating cancer in humans. The use of basil extract effectively impeded the growth of breast cancer cells in laboratory tests conducted in test tubes. The scientists found that basil extract had the capacity to induce apoptosis, which is the inherent mechanism of cell death. The usage of basil extract effectively reduced the activity of certain genes linked to the proliferation of cancer cells (2).

(ii). Inhibits basil extract breast cancer cell growth

Recent in vitro studies have demonstrated that basil extract possesses the capacity to impede the proliferation of cancer cells within controlled laboratory settings. One example pertains to a study which discovered the capability of basil extract to inhibit the proliferation of breast cancer cells by a substantial margin of 80%. This suggests that the application of basil extract effectively impeded the growth of a significant majority (80%) of breast cancer cells (3).

3. Basil plant studies in animal

(i). Efficacy of basil extracts in cancer prevention

Basil extract is a naturally occurring compound that has demonstrated promising anti-cancer characteristics in various studies. Furthermore, apart from its notable capability to impede the proliferation of cancerous cells basil extract has demonstrated promising alternative qualities with potential anticancer effects. To explain evidence has demonstrated that basil extract can elicit apoptosis an intricate process of cellular self-destruction. Research studies have demonstrated that Basil extract possesses the ability to attenuate the expression of specific genes implicated in the proliferation of cancer cells. It is imperative to acknowledge that the aforementioned active compounds found in basil possess potential anticancer attributes. Further investigation is imperative in order to comprehensively comprehend the prospective anti-neoplastic attributes of basil.

(ii). Basil extracts reduced tumors in mice exposed to cancer-causing chemicals

Mice which are diminutive mammals are frequently working for scientific investigations in labs. Substances implicated in cancer are chemicals capable

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of causing DNA damage and subsequent cancer development. Tumors are uncontrolled collections of abnormal cells that have the potential to increase in size within an organism. The utilization of basil extract resulted in a decrease in the quantity of tumors in mice that were subjected to cancer causing substances this implies that the basil extract was effective in inhibiting the development of tumors in these mice (4).

4. Human studies

(i). More research needed to determine if basil treats human cancer

Research on the effects of basil on cancer has primarily been carried out using test tubes and mice. There is evidence suggesting that basil extract could possess promising qualities in fighting cancer. Further studies are required to ascertain the efficacy of basil extract for the prevention or treatment of cancer in humans. There are several factors that indicate the necessity for further research. To date, the research conducted on this matter has been limited in scale and has not involved human subjects. Additionally, the duration of the studies conducted on basil extract is insufficient to establish its safety and efficacy.

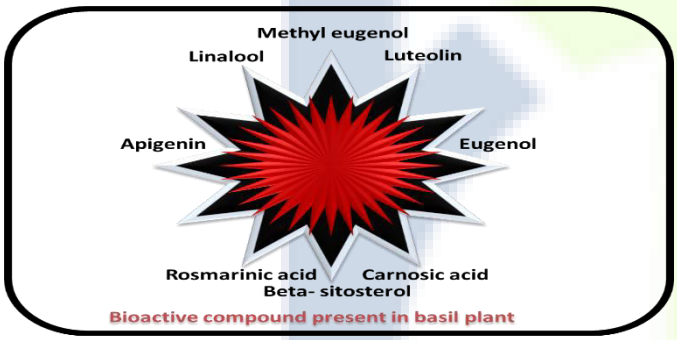
(ii). Traditional cancer therapy

Conventional cancer therapy encompasses customary approaches for treating cancer such as surgical procedures, chemotherapy and radiation therapy. These well-established treatments have proven their effectiveness in fighting cancer and should not be replaced with unverified or untested remedies. Basil an internationally recognized herb has been active for centuries in ancient healing customs. Research suggests that basil may have potential qualities in combating cancer. Nevertheless, additional research is necessary to determine the potential effectiveness of basil in treating cancer in humans (5).

5. Active compounds in basil plant

(i). Eugenol bioactive compound

Eugenol is a bioactive compound present in basil exhibiting notable properties such as anti-oxidative, anti-inflammatory and anti-proliferative



activities. This

Figure 2: Bioactive compound present in basil plant

phenomenon potentially contributes to cellular protection against damage impedes the growth of cancerous cells, and facilitates the elimination of cancer cells.

(ii). Linalool bioactive compound

Linalool a compound present in basil possesses properties that can combat inflammation and oxidation. Additionally, it might have the potential to hinder the proliferation of cancerous cells.

(iii). Methyl eugenol bioactive compound

Methyl eugenol which is present in basil, has been proven to effectively impede the proliferation of cancer cells when tested in laboratory conditions.

(iv). Rosmarinic acid bioactive compound

Rosmarinic acid present in basil possesses beneficial properties such as being an anti-oxidant reducing inflammation and inhibiting cell proliferation. It could potentially assist in shielding cells from harm inhibiting the proliferation of cancer cells and facilitating the elimination of cancerous cells.

(v). Apigenin bioactive compound

Apigenin a flavonoid present in basil possesses beneficial qualities as an anti-oxidant and anti-inflammatory agent. Furthermore, it might provide cellular defense and facilitate the demise of malignant cells.

(vi). Luteolin bioactive compound

Luteolin which is also a flavonoid present in basil possesses properties of being an anti-oxidant and an anti-inflammatory agent. Additionally, it can aid in safeguarding cells against harm and facilitating the elimination of cancer cells.

(vii). Carnosic acid bioactive compound

Carnosic acid discovered in basil possesses both antioxidant and anti-inflammatory characteristics. Additionally, it has potential benefits in safeguarding cells against harmful impacts and facilitating the elimination of cancerous cells.

(viii). Beta-sitosterol bioactive compound

Beta-sitosterol which is present in basil possesses both antioxidant and anti-inflammatory characteristics. It could potentially assist in reducing cholesterol levels (6).

6. Conclusion

Basil promising for cancer treatment and prevention. More research needed to understand its capabilities. Basil is promising for cancer prevention and treatment. Basil has anti-oxidant, anti-inflammatory and anti-proliferative properties. These compounds protect cells slow cancer growth and cause cancer cell death. Basil has demonstrated anti-cancer properties in lab experiments. More research needed to verify basil's cancer prevention potential in humans. Basil is a safe and famous plant with exceptional abilities. The substance is safe and has minimal negative effects. The basil-cancer study shows positive results. More research is needed on basil's effectiveness against cancer in humans

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