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Nigella Sativa use for the Treatment of Cancer

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ABSTRACT

Cancer is a sickness where cells in the body grow and spread out of control. Nigella sativa has been used in traditional medicine for many years. Nigella sativa has been studied a lot to see if it can help fight cancer. Here, we study N. sativa can help fight cancer. Sativa removes, with this survey focusing on the abilities of N. Sativa. N. sativa can stop cancer cells from growing, help them die, and also help protect healthy cells. It can also stop cancer cells from spreading to other parts of the body. Nigella sativa reduces cancerous growths. Crude oil and thymoquinone, taken from the seed and its oil, can fight diseases like cancer, heart problems, diabetes, asthma, and kidney diseases. It fights cancer in the blood, lungs, kidneys, liver, prostate, breasts, cervix, and skin, with very little chance of it spreading. The effect of N. Sativa has been known to have some effects on cancer for a long time, but research on this plant as a medicine has only been done recently. Research on this important traditional medication is limited and there are only a few reports in the scientific database.

Introduction

Cancer is a big problem in society today and is the second most common cause of death after heart attacks. Every year, many people die from different types of cancer, even though we try really hard to find ways to stop and treat it. In the last 100 years, modern medicine has made big progress in treating diseases. But a lot of illnesses, like different types of cancer, are still not completely treated. Researchers are looking at both old and new ways of healing to find new and effective treatments [1]. *Nigella sativa* has been used as medicine for a long time. This tradition started in Southeast Asia and then was used in ancient Egypt, Greece, the Middle East, and Africa. The Islamic tradition and the healing power of medicine are important for healing and are an unusual type of medical treatment [2]. This plant is a flower plant and its seeds are used as a spice in cooking. In English, the seed is often called black cumin, and in ancient Latin it was named "Panacea", showing that it was used for healing. In Arabic, the seed is called "Habbah Sawda" or "Habbat el Baraka", which means "Seed of blessing". In Arabic, people call the seed "Habbah Sawda" or "Habbat el Baraka", which means "Seed of blessing". This tree is called "Kalo jeera" in Bangladesh, "Kalonji" in India, and "Hak Jung Chou" in China [3]. The plant's seeds and oils are important for medicine. The main parts of *N. Sativa* could help keep you healthy and might treat different illnesses like cancer. One way it works well is by lowering the chance of atherosclerosis. It does this by lowering bad cholesterol in the blood and raising good cholesterol. It helps diabetes by making the body healthier and protecting the cells that make insulin in the pancreas. This can help as a treatment for diabetes. Take care of and keep safe. It helps control high blood pressure [4]. It effectively reduces airway inflammation in people with asthma, and its components show potential as a complementary treatment for schistosomiasis. In addition, its oil also protects kidney tissues from damage caused by harmful oxygen molecules, thereby preventing kidney dysfunction and structural abnormalities. For countless centuries, seeds, oils and extracts derived from *N. sativa* have been used for their anti-cancer properties in traditional systems of medicine such as Unani, Ayurveda and ancient Chinese medicine. These systems were developed in Arabic, Indo-Bangla and Chinese respectively [5].

Role of *N.sativa* as Anti-Cancer Mediators

A lot of useful substances have been found in the seeds of *N. Sativa* is a type of cannabis plant. Instead, it should be written in a simpler and easier to understand language. *Nsativa* seeds contain oils, proteins, alkaloids and saponins. These components were analyzed to quantify four important pharmacological elements in the oil: thymoquinone, dithymoquinone, thymohydroquinone and thymol. *Nsativa*

seeds are seeds of the sativa plant. The main component in the essential and fixed oils of the seeds, called thymoquinone, is believed to be responsible for a significant portion of their biological effects. Thymoquinone is often recognized for its powerful abilities as an antioxidant, anticancer, and antimutagenic agent. In addition, thymoquinone has acceptable safety levels, especially when administered orally to animals in experiments. Alpha-hederin is a compound found in black seed that comes from the seeds of the *N. sativa* plant [6].

Blood Cancer

Thymoquinone stops the growth of a type of cancer cells called HL-60 cells, which are found in human myeloid leukemia. Researchers studied different forms of thymoquinone with 6-alkyl residues and terpenes in HL-60 cells and 518A2 melanoma. The scientists discovered that these substances can cause a process called apoptosis, which is when the DNA breaks into pieces, the energy in the cell decreases, and there is a small increase in harmful chemicals. They found that α-hederin made P388 murine leukemia cells die by causing more apoptosis to happen, and this happened more as the dose of α-hederin and the time went up [7].

Breast Cancer

The mix of alfalfa, melatonin and retinoic acid helped lessen the bad effects of DMBA on breast cancer in mice. Thymoquinone was tried on breast cancer cells called MCF-7/Topo. Thymoquinone has a special part called terpene and 6-alkyl. They discovered that these substances made cells die through a process called apoptosis [7].

Colon Cancer

Thymoquinone can help fight colon cancer cells and promote cell death. This was shown in a study where the *N.sativa* volatile oil was used on colon cancer cell line HCT116. *N.sativa* can stop the growth of colon cancer in rats, after it has started, without causing any noticeable negative effects. Thymoquinone is a substance that can be used as a treatment for colon cancer cells. It works similarly to a drug called 5-flurouracil. However, thymoquinone did not have any effect on HT-29 (colon adenocarcinoma) cells [1].

Pancreatic Cancer

Thymoquinone is the most important chemical in *Nigella sativa*, which is known for its important healing properties. The study looked at sativa oil extract affects the way pancreatic cancer cells grow and die. Scientists have suggested using thymoquinone to stop inflammation and encourage cells to die in a certain way [8]. This could be a new way to treat inflammation. Thymoquinone can help make pancreatic tumors more sensitive to standard treatments by reducing the effects of gemcitabine or oxaliplatin on NF-kappa B activation. Mucin 4, a big molecule with sugar attached to it, is not working properly in pancreatic cancer. This strange expression is important for many things like cells change, grow, spread, and resist chemotherapy in pancreatic cancer. The study looked at thymoquinone affects MUC4 expression in pancreatic cancer cells [7].

Hepatic Cancer

A lot of research has been done to study well different treatments can kill cancer cells. This study wanted to see if sativa seeds can affect liver cancer cells grow. The test showed that N can stop HepG2 cells by 88% after being left with them for 24 hours at different amounts. So, using sativa extract is very important in academic discussions. Thymoquinone has been found to help the body's quinone reductase and glutathione transferase work better when taken by mouth. The properties of thymoquinone make it possible to prevent cancer caused by chemicals and protect the liver from damage [9].

Lung Cancer

The cancer-fighting ability of α-hederin found in *N.staiva* is being studied. The research looks at sativa affects lung cancer in mice. A study also showed that putting honey and N. Adding sativa to the diet makes a big difference. Sativa helps protect against oxidative stress and inflammation caused by certain chemicals and can help prevent lung, skin, and colon cancer. Alfalfa has been looked at a lot because it might have healing powers [2]. These chemicals have different effects on living things, such as reducing inflammation, fighting cancer, and preventing damage caused by harmful substances. Additionally, they look like they could help treat heart problems and might assist in cancer treatment. Understanding α-hederin and thymoquinone work can help us use them in medicine. More research is needed to understand they can help people and make sure they are safe and work well in medical treatment. N sativa does not have a big impact on cell death or programmed cell death in lung and laryngeal cancer cells [10].

Skin Cancer

Topical use of *N. sativa* is a common form of management used in a variety of settings. sativa extract showed an inhibitory effect on the initiation and promotion stages of skin carcinogenesis in mice when administered intraperitoneally. Skin application of 20-methylcholanthrene resulted in a significant reduction in soft tissue sarcomas, which was limited to 33. 3%, compared to 100% incidence observed in the MCA control group [11].

Fibrosarcoma

Thymoquinone, taken from the seeds of *Nigella sativa*, has been studied a lot for its possible healing powers because of its different biological effects. The administration of sativa one week prior to and following MCA treatment exhibited a notable hindrance in the development of fibrosarcoma tumor occurrences, as well as a reduction in tumor mass, by 43% and 34% respectively, in comparison to the outcomes observed in the MCA solitary treatment group. Furthermore, it was observed that thymoquinone exhibited a delayed onset of fibrosarcoma tumors induced by the administration of MCA. Moreover, *in vitro* investigations demonstrated that thymoquinone exhibited

inhibitory effects on the viability of fibrosarcoma cells. Alfalfa oil is a special kind of oil from the Medicago plant that can decrease the ability of human fibrosarcoma cells to break down fibrin in lab tests [1].

Renal Cancer

There is an existing body of research that highlights the potential chemo-preventive efficacy of *N.sativa*, a substance that has garnered significant scientific interest. N sativa has inhibitory effects on renal oxidative stress, hyperproliferative response, and iron nitrilotriacetate-induced renal carcinogenesis. In this experimental study, alfalfa was administered orally to rats for therapeutic purposes.The administration of sativa elicited a pronounced reduction in the generation of H2O2, synthesis of DNA, and occurrence of tumors [12].

Prostate Cancer

Thymoquinone comes from Nigella seeds and has many important medical qualities. The extract from the sativa plant can slow down the making of DNA, stop cells from growing, and reduce the ability of cancer cells in the prostate to survive. These changes were seen only in cells that have cancer, not in cells that do not have cancer. It was found that this result happened because the androgen receptor and transcription factor were decreased [13]. Thymoquinone was found to work well in treating both hormone sensitive and hormone-refractory prostate cancer in different experiments. Research done in the lab and in animals shows that thymoquinone can stop the growth of new blood vessels. In addition, thymoquinone was found to stop the growth of blood vessels in a human prostate cancer model in mice. Also, when used in small amounts, thymoquinone stops the growth of human prostate tumors, with very few chemical side effects. Furthermore, thymoquinone affects endothelial cells more than cancer cells by causing cell death, stopping cell growth, and blocking cell movement. Thymoquinone stopped the activation of a protein called extracellular signal-regulated kinase, which is usually turned on by a substance called vascular endothelial growth factor. However, it did not stop the activation of the vascular endothelial growth factor receptor 2 [14].

Cervical Cancer

The extracts of *N. sativa* were obtained using methanol, n-hexane, and chloroform. The sativa plant caused human cervical cancer cells to die. "We looked at terpene-terminated 6-alkylthymoquinone residues affect cervical cancer cells that are resistant to multiple drugs. " Thymoquinone derivatives have been discovered to make cells die in a certain way called apoptosis [4].

Molecular Mechanism of N.sativa Action Against Cancer

Cancer happens when cells grow in an unusual way because of changes in the genes. So, any medicine that fights cancer can either protect DNA from changing or kill cancer cells that have changed. *N. sativa* seeds have been extensively studied for their pharmacological properties. Thymoquinone, a major active compound found in *N. Sativa* seeds, has demonstrated promising therapeutic effects in numerous medical conditions. These studies have shed light on the potential of thymoquinone as a valuable agent in disease prevention and treatment. Sativa exhibits its efficacy in combatting cancer cells through various molecular pathways. Possible mechanisms underlying the action of thymoquinone. Thymoquinone helps kill cancer cells by turning on genes that cause cell death and turning off genes that keep the cells alive. Thymoquinone effectively hinders the activation of Akt by means of dephosphorylation, ultimately impeding the viability of cancerous cells [15]. There is currently ongoing research regarding topic *N.sativa* in the academic community. *Nsativa* or thymoquinone oil exhibits antioxidant properties, leading to enhanced enzymatic activity of antioxidant enzymes including superoxide dismutase, catalase and glutathione peroxidase. Notably, increased activity of these antioxidant enzymes has been shown to be beneficial in fighting various forms of cancer. The use of alfalfa oil or thymoquinone has been observed to reduce the toxicity of various anticancer drugs due to enhanced activation of antioxidant mechanisms. This result suggests that these drugs have great promise for clinical use in mitigating the harmful effects associated with anticancer drugs [4].

Concluding rrmarkers

Nigella sativa (*N.sativa*), commonly known as dim seeds, have been broadly inspected for their promising anti-cancer properties. Many *in vitro* and *in vivo* tests have outlined the practicality of *N.sativa* in preventing the improvement and development of diverse sorts of cancer cells. In extension to its facilitate cytotoxic impacts, *N.sativa* has been found to have solid antioxidant, anti-inflammatory, and immunomodulatory properties, all of which contribute to its anti-cancer development. Besides, *N.sativa* has appeared potential in sensitizing cancer cells to customary chemotherapy and diminishing chemotherapy-induced side impacts [16].

Nigella Sativa Good for Cancer

Nigella sativa has attracted a lot of interest from researchers and scientists. Extracts and seeds of the *N. sativa* plant and its active ingredient thymoquinone have been thoroughly studied, with excellent results showing that *N. sativa* has medicinal potential. The sativa strain tends to have medicinal properties that can be effective in treating a variety of ailments, including cancer [7].

N.Sativa Extracts be used to Treat Cancer

N.sativa extracts have the prospective application in the advancement of efficacious therapeutic agents for combating cancer. These fractions can act alone or in combination with chemotherapeutic drugs that have proven to be effective agents for modulating tumor initiation, proliferation and metastasis, making them possible treatments for many types of cancer [17].

Pro-Apoptotic and Anti-Proliferative Effects of *N. Sativa*

N.sativa has the ability to fight against cancer. Researchers have

gathered a lot of evidence about sativa by studying it outside of living organisms and inside them. They have used different types of cells and animals to do this. The scientists in the study said that they didn't look at the extracts from each individual plant in the mixture could fight cancer because only the mixture is used in cancer treatment. Sativa extracts are extracts from the sativa plant. In an initial test on living organisms, we applied *N.sativa* using a cream or ointment on the surface. The *N.sativa* extract slowed down the development of skin cancer and reduced the appearance in mice when they were exposed to certain chemicals [18].

Signaling Pathways Fundamental the Anti-Cancer Effects of *N. Sativa*

Many tests were done in the lab and on living organisms to understand *N.sativa* fights against cancer at a molecular and cellular level. Sativa is a type of plant. The main ways that *N.sativa* (a specific substance) helps fight against cancer are not yet fully understood, but they have been well-documented. The effects of sativa are mostly due to their capability to control the action of important enzymes. Reduce swelling and encourage the natural death of cancer cells [15].

N.Sativa Phytoconstituents and Anti-Cancer Effects

The anti-cancer impacts of *N.sativa* are exceptionally critical. The most fixing in *N.sativa*, called thymoquinone, has been connected to its impacts. Thymoquinone has been found to have a few useful impacts on cancer cells. It can offer assistance halt their development, empower cell passing, secure against harm caused by substances called oxidants, decrease the probability of changes, anticipate the arrangement of modern blood vessels that tumors got to develop, and moderate down the spread of cancer cells to other parts of the body. This *N.sativa* herb has been appeared to have properties that can battle cancer and murder cells. Be that as it may, we do not completely get it it works however, so more investigate is needed to figure out the points of interest. Sativa phytoconstituents are the common compounds found within the sativa plant (Figure 1) [4].

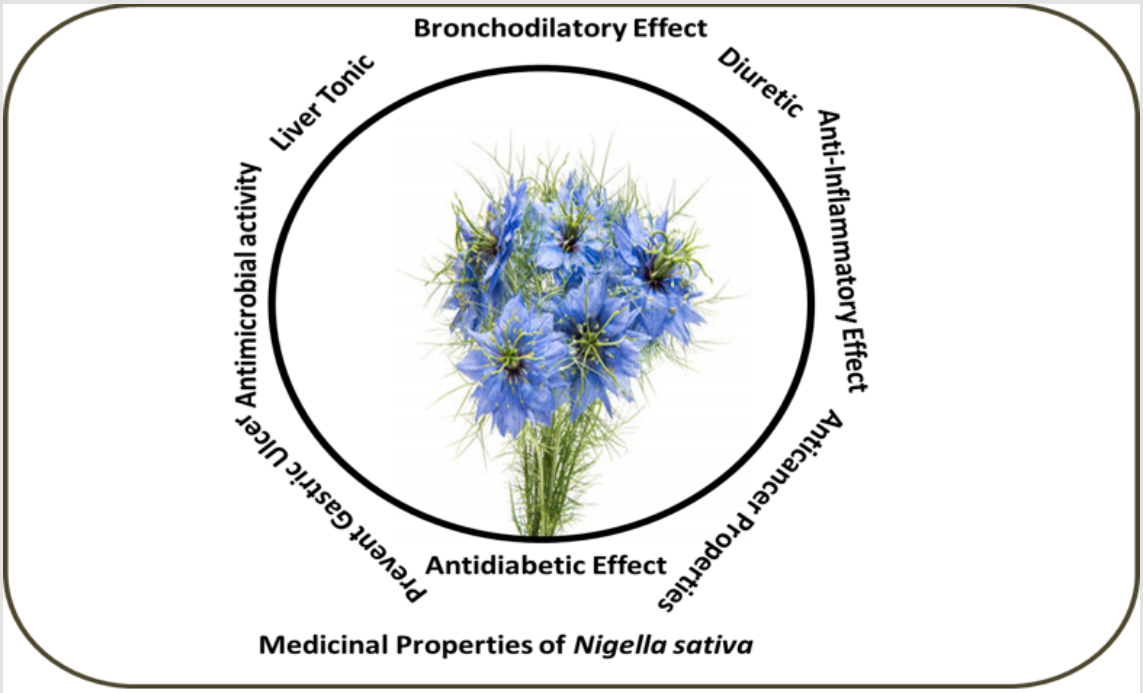

Figure 1: Medicinal effect of *Nigella sativa*.

Conclusion

Nsativa is a very popular herb that has been used by people for a long time. Many people think *Nsativa* is a special plant that can help heal and reduce the effects of infections, such as cancer. The ability of *N.staiva* to fight cancer. Sativa is good because it can help stop cells from growing, help cells die, and protect cells from damage and cancer. *N. sativa* ability to defend effectively. Sativa can help stop tumors from forming and spreading, partly because it can prevent them from getting worse and has a mild stimulating effect that is safe. The tests done in the lab and on living organisms show that *N. Sativa* extract can be used to create helpful and powerful starting materials that can be used at different times during the process. Cancer can form tumors in different parts of the body. There are different treatments for different types of cancer. More testing is needed to understand N helps

fight cancer at the atomic and cellular level. Sativa researchers want to understand the exact ways that N. stops certain signals in the body. The sativa extract is involved in the development of tumors and cancer. In the future, we need to study *N.staiva* can work together with other things to fight cancer. Sativa extract being used to prevent and treat cancer in research and medical settings.

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