



Medicinal Uses of *Foeniculum Vulgare* Mill and Small Cardamom: A Review

Manju Nag¹, Sanyogita Shahi^{1*}

¹Kalinga University, Raipur, Chhattisgarh, 492101, India

*Corresponding author's E-mail: drsanyogitashahi@gmail.com

Article History	Abstract
Received: 06 June 2023 Revised: 05 Sept 2023 Accepted: 08 Nov 2023	<p><i>Foeniculum vulgare</i> Mill, commonly known as fennel, and small cardamom are both traditional spices in India. They have been used for centuries in Indian cuisine for their unique flavor and aroma, as well as their medicinal properties. Foeniculum Vulgare Mill (fennel) is a flowering plant native to the Mediterranean region. It is a member of the parsley family and is cultivated worldwide for its culinary and medicinal uses. Fennel seeds, leaves, and stems can all be used medicinally. Fennels are used in digestive disorders such as indigestion, gas, bloating, and colic. It can also help to relieve nausea and vomiting, respiratory problems: to loosen mucus and relieve coughs and bronchitis, menstrual cramps and pain, lactation: to increase milk production in breastfeeding mothers and a variety of other conditions, including insomnia, anxiety, and high blood pressure. Small cardamom is a spice that is native to India and Sri Lanka. It is one of the most expensive and popular spices in the world. Cardamom is used in both sweet and savory dishes, and it is also used in traditional medicine to cure digestive problems such as indigestion, heartburn, and gas and also help to relieve nausea and vomiting, respiratory problems like bronchitis, asthma, and coughs. It has expectorant and anti-inflammatory properties that can help to clear mucus from the lungs and airways. Cardamom can be used to freshen breath and prevent cavities. It has antibacterial and antifungal properties that can help to fight against the bacteria that cause plaque and tartar. It has also treated a variety of other ailments e.g. high blood pressure, cholesterol, and diabetes. It has also been shown to have antioxidant and anti-cancer properties. Fennel and Small Cardamom are often used together in traditional medicine. The combination of these two spices is thought to be particularly effective for treating digestive disorders and respiratory problems. This literature review is focus on various nutritive value and medicinal importance of fennel and Small Cardamom.</p> <p>Keywords: Digestive Disorders, Respiratory Issues, Traditional Spice</p>
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1. Introduction

Small cardamom belongs to the Zingiberaceae family and is obtained from the seeds of *Elettaria cardamomum* Maton. It is grown in India, Guatemala, Sri Lanka, Nepal, Indonesia, Costa Rica, Mexico and Tanzania. It is viewed as the Queen of Spices and is quite possibly the costliest flavors. In India, cardamom was customarily considered as a spice and was one of the fixings in Ayurveda (the old Indian study of medication and way of life) and customary Chinese medication. It was accepted to be a solution for teeth and gum diseases, throat issues, blockage of the lungs, pneumonic tuberculosis, aggravation of the eyelids, gastrointestinal issues, deteriorating kidneys, and gallbladder stones, and was additionally utilized as a remedy for toxic substances and toxins. Cardamom is loaded with cancer prevention agents (Sudaldeep Sahoo and Sanyogita Shahi, 2021).

2. Literature Review

Fennel

Scientific name: *Foeniculum vulgare* Mill Common name: fennel, sweet fennel, Florence fennel, saunf



Fig 1 (a): *Foeniculum Vulgare* (Fennel)

Chemical constituents:

The parts of fennel such as roots, leaves, fruit and especially the seeds are used. Trans anethole is the major bioactive constituent of *foeniculum vulgare* (fennel). Different constituents incorporate alpha pinene, beta myrcene, beta pinene, harsh fenchone, camphene, estragole (methyl-chavicol), fenchone, limonene, p-cymen, and safrole. Also contain protein, fat, minerals, fiber and carbohydrates. Fennel is a rich source of beta-carotene and vitamin C, as well as calcium, magnesium, iron, and lesser amounts of other metal cations. The preliminary phytochemical study revealed the presence of saponins, flavonoids, cardiac glycosides, sterols, triterpenes, coumarins and volatile oils.

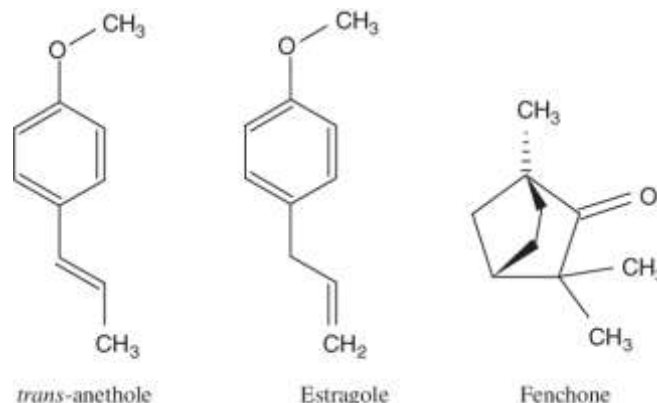


Fig 1(b): Bioactive components of *Foeniculum vulgare* (fennel)

Biological activity:

Fennel has numerous natural exercises due to its unpredictable what's more, non-volatile mixtures. It's recommended as a sweet-smelling stomachic in TCM to treat different conditions, especially ailment, cold torment and stomach. Fennel fundamental oil had carminative and energizer exercises just as spasmolytic activities on the sleek muscles. *Foeniculum vulgare* is authoritatively noted in Ayurvedic Pharmacopeia as a significant piece of polyherbal definitions in the treatment of various infections and problems. A number of organic pharmacological examinations have been embraced to assess the native employments of *F. vulgare*. Not many concentrates of *F.vulgare* and confined mixtures have been assessed for a few exercises, specifically, antiaging, antiallergic, anticolic, antihirsutism, calming, antimicrobial and antiviral, antimutagenic, antinociceptive, antipyretic, antispasmodic, diuretic, estrogenic properties, expectorant, gastrointestinal impact, hepatoprotective, hypoglycemic, hypolipidemic and so on.

1. Antimicrobial, Antifungal and Antibacterial Activities:

The antimicrobial movement of plant oils and concentrates has been perceived for an extended time, and that they have numerous applications, including crude and handled food safeguarding, drugs, elective medication and normal treatments, fennel displayed a robust antimicrobial action against microscopic organisms and parasites. Dillapional, scopoletin, dillapiol, bergapten, imperatorin, psolaren and dillapional were discovered to be antimicrobial standards against *Bacillus subtilis*, *Aspergillus niger* and *Cladosporium cladosporioides*. Essential oils from the products of fennel appeared huge antibacterial action. Dichloromethane concentrates and fundamental oils from *F.vulgare*

showed antifungal action against *Candida albicans*. It very well may be the contender for an additional antifungal specialist for candidiasis and other contagious sicknesses.

2. Antioxidant activity:

Fennel was called as excellent sources of nature antioxidants and contributed to the daily antioxidant diet. Fennel is understood as an impressive wellspring of common cell reinforcements. This plant can hinder free extremists due to the high substance of polyphenols and flavonoids. Phenolic compounds in this spice, as an example, caffeoylquinic corrosive, rosmarinic corrosive, eriodictyol-7-orutinoside, quercetin-3-O-galactoside, kaempferol 3-O-glucoside appeared cancer prevention agent movement. Fennel unstable oil has solid cancer prevention agent movement, as well. Plant ethanolic and fluid extricates in contrast with its pith has less antioxidant movement.

3. Anti-inflammatory activity:

The pharmacological impacts of fennel plant, calming movement can be noted. Exploration has shown that the methanol concentrate of fennel has calming impacts. Kataoka et al. contemplated anti-inflammatory impacts of fennel. The outcomes showed that the methanol concentrate of fennel seeds restrains aggravation through cyclooxygenase and through lipoxygenase pathways.

4. Anti-anxiety activity:

Anxiety is that the unpleasant feeling of fear and concern. When anxiety becomes excessive, it's going to be considered as a mental disorder. Anxiolytic movement of the unrefined concentrate of fennel has been announced. Fennel due to phytoestrogens widely has helpful use within the treatment of estrogen inadequacy anomalies. Estrogens are chemicals that are included within the marvel of nervousness which seem to act by means of the GABA A receptors fennel presumably could be a home-grown cure that has anxiolytic impacts interceded by GABA-ergic framework and estrogen receptors. Koppula et al. investigated the properties of fennel extract in rats. This study showed that this herb with several functions like anti-stress proceeding, increase in memory and antioxidant effects may reduce stress and stress-related disorders.

5. Gastro-protective activity:

In an exceedingly study investigated the effect of fennel plant on peptic ulceration. The findings showed that the plant had a protective effect on peptic ulcer. additionally, the herb reduced mucosal lining of the stomach. These functions were attributed to its antioxidant capacity It has been shown that fennel plant has huge defensive impact on gastrointestinal issues. It absolutely was shown that the use of fennel oil emulsions dispensed with colic in treated newborn children which was impressively better than the benchmark group.

2. Small Cardamom

Scientific name: *Elettaria cardamomum* Common name: small cardamom, green cardamom, or true cardamom, Ailum, Elachi.



Fig 2 (a): True Cardamom **Fig 2(b):** Cardamom Pods (elaichi)

Introduction and Description:

Small cardamom belongs to the Zingiberaceae family and is obtained from the seeds of *Elettaria cardamomum* Maton. It is grown in India, Guatemala, Sri Lanka, Nepal, Indonesia, Costa Rica, Mexico and Tanzania. It is viewed as the Queen of Spices and is quite possibly the costliest Flavors. In India, cardamom was customarily considered as a spice and was one of the fixings in Ayurveda (the old Indian study of medication and way of life) and customary Chinese medication. It was accepted to be a solution for teeth and gum diseases, throat issues, blockage of the lungs, pneumonic tuberculosis, aggravation

of the eyelids, gastrointestinal issues, deteriorating kidneys, and gallbladder stones, and was additionally utilized as a remedy for toxic substances and toxins. Cardamom is loaded with cancer prevention agents (Sudaldeep Sahoo and Sanyogita Shahi, 2021)

Chemical constituents:

The bioactive component of the volatile oil is cineole. The essential oil in the seeds contain α -terpineol, myrcene, limonene, menthone, β -phellandrene, 1,8-cineol, sabinene and heptane. Dried fruit of cardamom contains steam volatile oil, fixed (fatty) oil, pigments, proteins, cellulose, pentoses, sugars, starch, silica, calcium oxalate and minerals. The main factor that determines the quality of cardamom is the content and composition of volatile oil, which governs the odour and flavour (Sanyogita Shahi, Megha Turkane and Shirish Kumar Singh, 2023).

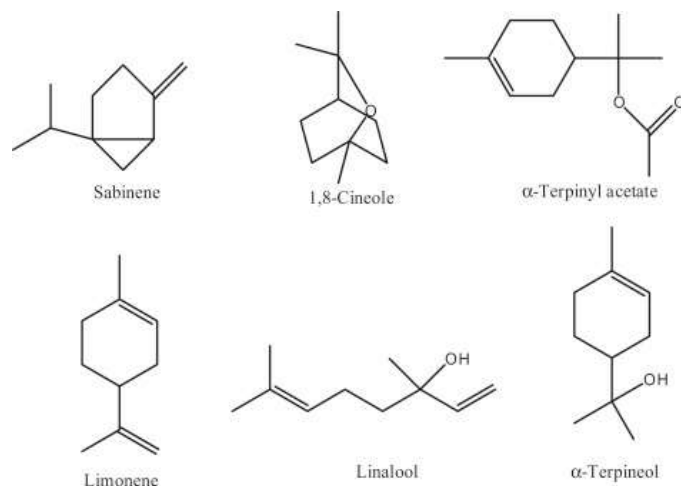


Fig 2(c): Structure of Chemical Components of Elettaria Cardamomum.

Biological activity:

Cardamom has the accompanying therapeutic properties: The major bioactive properties of cardamom fundamental oil are its germ-free, carminative, stomach related, diuretic, energizer, stomachic, tonic and antispasmodic, antimicrobial and calming exercises. It has been utilized to treat bronchitis, hemorrhoids, stangury, renal and vesical calculi, anorexia, dyspepsia and gastropathy and so forth.

1. Anti-inflammatory activity:

Cardamom is utilized extensively to treat contaminations in teeth and gums, to forestall and treat throat inconveniences, clog of the lungs and pneumonic tuberculosis, aggravation of eyelids and furthermore stomach related issues. Species in the variety amomumare additionally utilized in conventional Indian medication.

2. Hepatoprotective:

The components in the volatile oil, e.g., 1,8- cineole, terpinene, terpinol, sabinine, α -pinene and imonene, act as a tonic for the heart and liver, an appetizer, promote the elimination of bile and help reduce congestion of the liver.

3. Antiulcerogenic activity:

The Petroleum ether soluble extract from elettaria cardamomum seeds was screened for aspirin-induced anti-ulcerogenic activity in rats.

4. Gastroprotective activity:

The oil ether solvent concentrates of cardamomum found to have gastroprotective action. Emission of gastric juices and acids from the stomach is kept up by this oil. Cardamom has extraordinary stomach related development in view of major oil presence in it. Entire stomach related framework is animating via cardamom fundamental oil. Fundamental oil has stomachic in nature, which keeps the stomach solid what's more, working appropriately. The spice also prevents other gastrointestinal ailments like acid reflux, heartburn, diarrhea, etc.

5. Anticancer activity:

The fundamental oil of cardamom containers in vitro considers showed anticarcinogenic impacts by hindering harm to grown-up DNA by aflatoxin b1 in a microsomal compound intermediated response.

The blends in cardamom may help fight cancer cells. This may be because of bioactive segments present in the essential oil that have possible anticancer jobs. Studies have shown that cardamom powder can assist the development of explicit mixtures that assist fight threatening development. The zest may in like manner improve the limit of basic killer cells to attack tumours. One investigation showed that a specific compound in the flavour halted oral malignant growth cells in test tubes from increasing. Despite the fact that the outcomes are promising, these examinations have just been led on mice or in test tubes. Human exploration is required before more grounded cases can be made.

6. Antioxidant and diuretic activity:

Cardamom may help lower pulse, in all likelihood because of its cancer prevention agent and diuretic properties. Cell reinforcements are common or manufactured mixtures that can be utilized for counteraction of free extreme arrangement through rummaging and concealment of ongoing and degenerative illnesses. Cardamom seeds and capsules are rich wellsprings of cell reinforcement substances that kill free extremists by forestalling oxidation of different segments (Sanyogita Shahi and Shirish Kumar Singh, 2022).

4. Conclusion

Fennel has been utilized as food and drug with long history in focal Europe and Mediterranean locale similarly as in China. It's likewise a flavour food with wellbeing esteem. Various mixtures including trans-anethole, estragole, fenchone, sesquiterpenoids, coumarins and polyphenolics were disconnected from this plant, the bulk of which shown huge bioactivities. The fennel has potential helpful restorative activities within the administration of bacterial and contagious contaminations and colic torment. Both the products of the soil plant of this plant could also be the wellspring of substance and organic materials in future.

Green cardamom [*Elettaria cardamomum* (L.) Maton. (Family: Zingiberaceae)] cases (regular items) have been used for ordinary medicine applications including for the control of asthma, teeth besides, gum pollutions, cascades, infection, free entrails, similarly as cardiovascular, stomach related and kidney issues. The adaptable utilization of cardamom containers has a few other advantageous wellbeing impacts that are applicable considering customary and present-day drug viewpoints. Cardamom natural products are utilized broadly as a spice and enhancing fixing in food sources, and are regularly perceived for their valuable wellbeing properties. They are furthermore used in fragrances. Phytochemical examinations have portrayed critical compound constituents of cardamom including sugars, proteins, minerals, lipids, essential oils, flavonoids, terpenoids and carotenoids. Cardamom has a couple of characteristic positions including cell support, antidiabetic, antibacterial, anticancer, gastrocautious and insecticidal properties.

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