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Phytochemistry and Pharmacology of Trachyspermum ammi

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Abstract

Trachyspermum ammi is a member of the family Apiaceae. The majority of medical uses for seeds and roots are as spices and diuretics, respectively. Ajwain oil, a dark oil, is found in seeds. This oil is used to treat respiratory conditions, gastrointestinal problems, and hunger disorders. The oil exhibited antibacterial, antifungal, and anti-aggregatory properties. On the other hand, ajwain is a traditional potential herb that is used for a number of ailments. The fruit possesses carminative, antispasmodic, stimulant, and anti-diarrheal properties.

Keywords: Trachyspermum ammi, Antimicrobial, Antifungal, Carminative, Anti-Diarrheal

Introduction

The plant Trachyspermum ammi, sometimes known as "Ajwain," is very important in medicine. The name "Ajwain" in Sanskrit, "Carom seeds" in Hindi, "Bishops weed" in English, "Omam" in Tamil, "Carambola grains" in French, and "Ajowan samen" in German are among its known variations (Gaddamwar, Rajput et al. 2020). It's an annual herb with leaves that are

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fluffy (Arif 2019). *The annual herb Trachyspermum ammi grows to a height of 60 to 90 cm and has many branches.* This herb has aromatic properties. It is cultivated in arid environments, i.e., dry and barren land (Zaki and Ahmad 2021). Although it originated in Egypt, it is currently extensively grown in Afghanistan, Pakistan, India, and Iran. (Zarshenas, Samani et al. 2014) Its fruit is small, oval-shaped, and greyish-brown in color, up to 2 mm in length and 1.7mm in width. (Azhar, Hussain et al. 2011) The presence of oil globules in the structure is also revealed by microscopic examination of the powdered herb. Its fruit has a strong aroma and a harsh taste.

Propagation Method:

Direct seeding takes place in the field. It takes these seeds between eight and ten days to sprout (Mosapour, Ghanbari et al. 2015). When plants attain the height of 20 – 25 cm then process of thinning should be carried out. Trachy spermumammi need 1.5 kg of seeds per acre in order to germinate (Kifelew, Getachew et al. 2017)

Sowing Duration

Because Trachy spermumammi is a "cold-crop" that is harvested in May or June, the optimal months to sow it are October through November (Reza and Reza 2015)

Chemical Constituents:

Studies reveal that an aqueous alcoholic extract of Ajwain seed reduces dose-dependent arterial blood pressure in an animal model (Kumar and Singh 2021). Additionally, it shows the decrease in dose-dependent K^+-induced contractions in the aorta of rabbits (Chatterjee, Goswami et al. 2013). To improve cardiac health and heart function, combine one tablespoon of Ajwain seeds with a small amount of warm water. Additionally, it eases chest pain (Mishra 2020).

Phrarmacological Properties:

Anti-Hypertensive and Cardio-protective:

Studies reveal that an aqueous alcoholic extract of Ajwain seed reduces dose-dependent arterial blood pressure in an animal model (Kumar and Singh 2021). Additionally, it shows the decrease in dose-dependent K^+-induced contractions in the aorta of rabbits (Chatterjee, Goswami et al. 2013). To improve cardiac health and heart function, combine one

tablespoon of Ajwain seeds with a small amount of warm water. Additionally, it eases chest pain (Mishra 2020).

Digestive Stimulant:

When Trachyspermum ammi is used, stomach juice secretion increases fourfold. Additionally, it demonstrates the beneficial impact on the secretory activity of digestive enzymes and bile acid (Dwivedi, Mishra et al. 2012). Moreover, it shortens the "food transit time," which is the amount of time needed for food to be absorbed, digested, and then eliminated. Food typically takes 36 hours to make its way through the entire digestive system. (Meena, Lal et al. 2018). It is also observed that ajwain also possesses "enzyme modulatory activity" and therefore enhances the pancreatic amylase and lipase activity (Tripathi, Kumar et al. 2017). The Trachyspermum ammi is a potent digestive stimulant medication because of all these characteristics. Take one tablespoon of ajwain and one tablespoon of brown sugar orally to benefit from its digestive qualities. You can use it without adding any sugar (Ebrahimi, Sobhanirad et al. 2018).

Anti-lithiasis and Diuretic effect:

Ethnobotanical survey reveals that ajwain possesses diuretic and anti-lithiasis properties. (Bhadra 2020) A research study reveals that after decoction in milk, ajwain was given orally to the people suffering from renal lithiasis (kidney stones) for the period of regular 9 days. (Bairwa, Sodha et al. 2012) It showed positive and effective results towards calcium oxalate crystals. It also causes the decrease in renal colic. (Shroha, Bidhan et al. 2019)

Antitussive and Bronchodilatory properties:

The extract as well as the essential oil of *Trachyspermum ammi* shows the inhibitory effect on histamine (H1) receptors and proves to be effective against cough and cold. (Tariq, Gore et al. 2014) Research studies reveal that an aqueous and concentrated extract of ajwain seed as well as carvacrol, codeine, and saline were studied by counting the number of coughs produced. Both extracts of ajwain showed a reduction in the number of coughs produced. (Chahal, Dhaiwal et al. 2017) Extract of ajwain shows the bronchodilatory effects in asthmatic persons. All this evidence proves the antitussive and bronchodilatory properties of ajwain. (Khan, Shameem et al. 2016). To utilize its antitussive effects and to treat cough,

cold, and flu conditions, ajwain seeds are boiled along with cinnamon with water. It is then stained and taken orally 4 times a day. (Hanif, Hassan et al. 2021)

Hypolipidemic and weight loss activity:

Research was conducted on albino rats that show the hypolipidemic activity of *Trachyspermum ammi*. Powdered drug was taken with an equivalent amount of methanol. This extract was given with the dose of 2 g/kg of body weight, and it showed a decrease in low-density lipoproteins (LDL), serum cholesterol level, triglycerides, and total lipids. (Samadian, KARIMI et al. 2015) This eventually leads to a decrease in obesity as well. For this purpose, drink half a glass of water with soaked ajwain seeds early in the morning on an empty stomach. This will assist in losing the fat. (Kamble, Patil et al. 2010) Otherwise, take 1 teaspoon of ajwain daily on an empty stomach after getting up. This aids in losing 3–4 kg of weight within a month. (Niaz 2013)

Anthelmintic activity:

Research analysis reveals that ajwain possesses anthelmintic activity against *Ascaris lumbricoides* in humans. It decreases the ATPase potential of helminths and thus leads to a decrease in their energy reserves. (Zaman, Iqbal et al. 2012) Besides this, Trachyspermum ammi exhibits cholinergic activity, which enhances the peristaltic movements of the gut and eventually aids in the expulsion of these helminths and parasites out of the gut. (Bairwa, Sodha et al. 2012)

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