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**AN OVERVIEW ON AJWAIN (*TRACHYSPERMUM AMMI*):
PHARMACOLOGICAL ACTIVITY AND MEDICINAL BENEFITS**

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ABSTRACT

Trachyspermum ammi L. (Apiaceae) is a crucial medicinal, aromatic and spice plant commonly called ajwain. Ajwain with its characteristic aromatic smell and spicy taste is widely used as a spice in curry. Several studies have already been done to validate its various activities. This study was conducted to validate the anti-bacterial and anti-fungal properties of methanolic and hexane seed extracts of two ajwain genotypes commonly grown in India. The findings showed significant antimicrobial activity in seed extract. The fruit has stimulant, antispasmodic and carminative properties and is employed as a vital remedy for flatulence, atonic indigestion, diarrhea, abdominal tumors, abdominal pain, hemorrhoids, bronchial problems, loss of appetite, galactogog, asthma and amenorrhea. Medically, it's been shown to own various medicinal properties like antifungal, antioxidant, antibiotic, antihypertensive, antispasmodic, broncho-dilating actions, ulcers.

Keywords: *Trachyspermum amm* , Ajwain, Thymol, Antimircobial, Antifungal

INTRODUCTION

Ajwain may be a small, erect, annual, herb with branched leaf stalks, leaf-like wings (2.5 cm long) and 4-12 bell flower heads with 6 - 16 flowers. The fruits are microscopic, grayish-brown in color and egg-shaped. *Trachyspermum ammi* L. (Apiaceae) is usually referred to as ajwain. Ajwain, *Trachyspermum ammi* (L.) spray, is an annual medicinal plant with a straight stem, native to India and East Persia. The most useful ingredient in ajwain is little fruit like caraway, which is usually appreciated in Indian delicacies, tasty food and snacks. In Ayurvedic medicine, it's used as a restorative plant for its stimulant, carminative, antispasmodic and tonic properties. In India, it's growing in Madhya Pradesh, Gujarat, Maharashtra, province, Punjab, Haryana, Rajasthan, Bihar and province. Oregano seeds are employed in many foods to flavor, as a preservative, in medicines and in perfumes to create essential oils for final use (Pruthi, 1992). In Indian medicine, ajwain is employed as a home remedy for stomach ailments, crushed fruit paste is applied externally to cut back colic pain, and hot and dry fermentation of chestnut fruit is employed as a typical remedy for asthma. Its seeds have stimulant, antioxidant, antitussive, antihypertensive, antimicrobial, antibacterial, carminative, diuretic, nematidal and hypolipidemic effects. High content of antioxidants, mainly polyphenols and flavonoids, make it a possible source for developing nutraceuticals.

Information of *Trichyspermum Ammi*-

Synonyms, Scientific Classification and Morphology of *Trachyspermum ammi*:

1. Vernacular Names :

Assamese: Jain.

Hindi: Ajwain, Jevain.

English: Bishop's weed.

Tamil: Omam.

Kannada: Oma, Yom, Omu.

Telugu: Vamu.

Bengali: Yamani, Yauvan, Yavan, Javan, Yavani, Yoyana.

Sanskrit: Yamini, Yaminiki, Yaviniki.

Malayalam: Oman, Ayanodakan. Gujrati: Ajma, Ajmo, Yavan, Javain

2. Scientific Classification:

Kingdom: Plantae.

Subkingdom: Tracheobionta.

Division: Magnoliophyta.

Superdivision: Spermatophyta.

Order: Apiales.

Class: Magnoliopsida.

Family: Apiaceae.

Genus: Trachyspermum.

Species: ammi.

Phytochemical Constituents of Ajwain : Variety of chemical components are accounted for the herb. moisture (8.9%), tannins, Fiber (11.9%), fat (21.1%), carbohydrates (24.6%), glycosides, protein (17.1%), saponins, flavones and other components (7.1%) involving thiamine, calcium, iodine, manganese, phosphorous, iron, cobalt, copper, riboflavin and vitamin B are of reported phytochemical components of Ajwain.



Fig.1 Flower of Ajwain



Fig.2 Leaves of Ajwain



Fig.3 Fruit of Ajwain

PHARMACOLOGICAL ACTIVITY OF *TRACHYSPERMUM AMMI*:

Antifungal activity: Antifungal action of volatile components of *T. ammi* seeds on 10 fungi (*Acrophialophora fuispora*, *Curvularia lunata*, *Fusarium chlamydosporum*, *F. poae*, *Myrothecium roridum*, *Papulaspora sp.*, *Alternaria grisea*, *R. T. ammi* seeds). 72-90% of all test fungi have been tested and located to prevent spread. Phenolic compounds such as

thymol and carvacol are known to be either bactericidal or bacteriostatic agents depending on the concentration used.

Antimicrobial Activity - The antimicrobial action of *T. ammi*, protecting food from microbial spoilage, laboratory testing of antimicrobial efficacy in vitro, and its use as an antimicrobial in humans also are studied. The active ingredients chargeable for the antimicrobial action of ajwain were reported to be carvacol and thymol. Thymol destroys even the foremost prevalent third generation antimicrobial and multi-drug resistant microbial pathogens and thus acts as a plant based fourth generation herbal antimicrobial formulation.

Antioxidant Properties - The antioxidant and modifying properties of ajwain extract are evaluated in in vivo investigations on hexachlorocyclohexane induced oxidative stress and toxicity. Accordingly, the results showed that dietary ajwain extract would scale back the toxicity caused by radical stress on the liver.

Antiulcer Activity: Anti-ulcer activity: Using different ulcer models, oregano ajwain ethanolic extract significantly reduced the ulcer index in pretreated animals and also showed ulcer protection altogether models. Overall the extract reduced ulcerative lesions compared to the control group of the animal model.

Antihypertensive & Antispasmodic activity: *T. ammi*'s antihypertensive effect was administered intravenously in vivo, and also the antispasmodic action in vitro showed that calcium channel blockade mediates the spasmolytic effects of stuff and it is believed that these mechanisms contributed to their observational results, and in conditions of hypertensive diseases like colic and diarrhea, also as in hypertension. Supported Ammi's traditional use..

MEDICINAL USES OF T. AMMI:

Ajwain seeds contain a little amount of oil called ajwain oil. The oil contains thymol, a phenol that creates the fruit smell like thyme. Thymol is often wont to treat digestive problems. It also has antifungal and antibacterial properties.

Digestive Health: The active enzymes in ajwain improve the flow of stomach acids, which helps in digestion, bloating and gas. The plant may be wont to treat peptic ulcers additionally as ulcers within the esophagus, stomach and intestines.

Infection Prevention: Many essential oils in ajwain, especially thymol and carvacrol, can help fight bacterial and fungal growth. They are *Salmonella* and *E. coli*. they also help fight bacteria like *E. coli*, which might result in illness and other stomach problems.

Lower Blood Pressure: Research on rats has shown that thymol calcium in ajwain can work to stop blood from entering your heart's blood vessels, which may help lower vital sign.

Cough And Congestion Relief: Ajwain can relieve cough still as clear the mucus in your nose, both of which make breathing easier. It also can help widen the bronchial tubes, which may help with asthma.

Toothache Relief: Anti-inflammatory properties of thymol and other essential oils, ajwain can help reduce the pain related to toothache. Thymol may help improve your oral health by fighting bacteria and fungi within the mouth.

Arthritis Pain Relief: Ajwain can even help to appease pain and swelling. Crushed fruit paste may be made and applied on the skin to treat joint pain. Alternatively, you'll fill your tub with lukewarm water and add a few of seeds for bathing.

CONCLUSION

Trachyspermum ammi (Ajwain) is a necessary, widely known, and used medicinal plant on account of these historic instances; this specific plant has wide founded and hidden medicinal and dietary use. This study conclude that *T. ammi* could be a source of medicinally active compounds and have various pharmacological activity with relevance the mentioned above pharmacological activities, Ajwain seeds is used for clinical applications.

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