

Available online on 15.03.2024 at <http://jddtonline.info>

Journal of Drug Delivery and Therapeutics

Open Access to Pharmaceutical and Medical Research

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Review Article

Therapeutic potential of Nankhawah/Ajwain (*Trachyspermum ammi* Linn): A comprehensive review article

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Article Info:



Article History:

Received 16 Jan 2024
Reviewed 14 Feb 2024
Accepted 03 March 2024
Published 15 March 2024

Cite this article as:

Naaz A, Wani GN, Begum W, Fathima S, Therapeutic potential of Nankhawah/Ajwain (*Trachyspermum ammi* Linn): A comprehensive review article, Journal of Drug Delivery and Therapeutics. 2024; 14(3):164-179

DOI: <http://dx.doi.org/10.22270/jddt.v14i3.6479>

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Abstract

Background: *Trachyspermum ammi* Linn., commonly known as *ajwain*, is a widely recognized spice and medicinal plant originating from Egypt but cultivated across regions such as Iraq, Iran, Afghanistan, Pakistan, and India. Belonging to the *Apiaceae* family, this species offers diverse pharmacological benefits due to its rich chemical constituents.

Objectives: This review aims to summarize the traditional and contemporary applications of *Trachyspermum ammi*, focusing on its ethnobotanical description, chemical composition, and pharmacological aspects.

Methodology: The literature search encompassed scientific databases and publications covering the historical usage, chemical profiling, and biological activities of *Trachyspermum ammi*.

Results: *Trachyspermum ammi* exhibits a variety of pharmacological activities, including antifungal, antioxidant, antimicrobial, antinociceptive, antispasmodic, carminative, diuretic, aphrodisiac, and anthelmintic properties. Traditionally, it has been employed to treat conditions such as flatulence, atonic dyspepsia, diarrhea, abdominal tumors, abdominal pain, piles, bronchial issues, lack of appetite, galactagogue, asthma, and amenorrhea as it possesses properties of *Muhallil*, *Mudirr-i-Bawl-o-Hayd*, *Dafa e Tafun*, *Jali*, *Habis* etc. Modern research supports these claims while also revealing its potential in treating kidney stones, abortion, and aflatoxin detoxification.

Conclusion: *Trachyspermum ammi* holds great promise as a natural resource for novel therapies, owing to its extensive array of bioactive components and established pharmacological effects. Further investigation into its mechanisms of action and optimization of extraction techniques could lead to more efficient utilization of this valuable medicinal plant.

Keywords: *Ajwain*, *Nankhawah*, *Trachyspermum Ammi* Linn, *Mudirr-i-Bawl-o-Hayd*, *Hazim*, *Thymol*, *Appetizer*.

INTRODUCTION:

Unani System of drugs is one of the oldest conventional devices of drugs which has strived via a while in the prevention and remedy of diverse scientific conditions. Traditional medicinal drug, as described through the World Health Organization, is the sum entire of the thoughts, skills, and system primarily based totally at the theories, faiths, and incidents indigenous to unrelated civilizations, whether or not explicable or not, Used within side to upkeep the fitness along with prevention, diagnosis and/or remedy of bodily or intellectual disorder.¹ According to the World Health Organization presently, 80% of the world population depends on herbal medicine for some aspect of primary health care. However, plants still provide some of our most valuable medicines.²

Trachyspermum ammi Linn. (*ajwain*) is an erect, aromatic annual herbaceous plant belonging to the *Apiaceae* family, which is used worldwide as a spice and has medicinal

properties, therefore it is being used since centuries as a traditional system of medicine.³ Many members of *Apiaceae* belong to vegetation or aroma. This family comprises of about 250 genera and more than 3300 species.⁴ '*Trachy*' means rough and '*Spermum*' means seeded while *ammi* is a latin word.⁵ India and eastern Persia is the origin of this plant.⁶ In the Indian Vedic literature, *charaka samhita* and *sushruta samhita*, the *Ajwain* is known as *bhootika* and in the *charaka samhita* commentaries, it is termed *yavanika*. The medicinal role of *Ajwain* fruit claimed to be very important in the treatment of many ailments in humans.⁷ In *Unani* it is termed as '*Naankhawah*' *Naan* means *chapati* and *khawah* means desirous of seeking as it act as appetizer.^{8,9} In pharmaceuticals this plant is known as *Fructus Ajwaini*⁴.

Ajwain seeds are used in certain domestic preparations like pickles, certain types of biscuits, confectionery, beverages and pan mixtures.⁴ 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.¹⁰ Traditional medical practices frequently employ *ajwain* for a number of pharmacological and therapeutic purposes. *Ajwain* has a long history in Traditional Persian Medicine (TPM) and is well-known.¹¹ Its extract is called Jawahar Kamun Mulki in Arabic, Jawahar *Nankhawah* in Persian, *Azwain* in Urdu and Thymol in English.¹²

Materials and Methods:

Thorough literature search was carried out to gather applicable data on *ajwain* through publically available electronic databases including pubmed, google scholar, scihub, science direct and other internet sources.

A large number of published research and review articles upto 2023 were reviewed. Keywords used are *ajwain*, *trachyspermum ammi* linn, unani medicine, emmenagogue activity, *Mudirr-i-bowl-o-Hayd*.

The name of species has been validated by using world flora online. Standard unani medical terminology published by CCRUM has been used to describe the proper unani terminologies. Additionally, the material was compiled using books that were published in both urdu and English as typical literature in unani medicine. This review examines the

pharmacological action, morphology, ethnomedical applications and therapeutic uses of this medicinal plant from the viewpoint of unani medicine.

Description of Ajwain in Unani:

Its leaves are like small earrings or leaves of coriander. Flowers are like white umbrella of soya or *badiyan*. Later grains are grown in similar way.¹³ Seeds are small like *anisoon*.¹⁴ They are usually harvested in February/march.¹³ All of its parts have strong smell and are brownish in colour.⁸ If its seeds are stored properly then it can be preserved for 3-4 years.^{13,14}

The most beneficial component of *Ajwain*, according to Persian practitioners, are its seeds. *Ajwain's* temperament can be characterised as hot and dry in the third degree, as well as having some bitterness and acidity.¹¹

Ethnobotanical Description:

It is said that the herb is extensively grown in dry and semi-arid sectors where the soil occupy high quantity of salts.⁶ *Ajwain* is a profusely branched annual herb, 60-90 cm tall. Stem is striated; inflorescence compound umbel with 16 umbellets, each containing up to 16 flowers; flowers actinomorphic, white, male and bisexual; corolla 5, petals bilobed; stamens 5, alternating with the petals; ovary inferior; stigma knob-like; fruit aromatic, ovoid, cordate, cremocarp with a persistent stylopodium; leaves pinnate, with a terminal and 7 pairs of lateral leaflets.¹⁵



Figure: Leaves, Flower and fruit of *Ajwain*¹⁰

Taxonomical Classification:

Kingdom: Plantae.

Subkingdom: Tracheobionta.

Division: Magnoliophyta.

Superdivision: Spermatophyta.

Order: Apiales.

Class: Magnoliopsida.

Family: Umbelliferae, Apiaceae.

Genus: *Trachyspermum*.

Species: *ammi*^{10,16,17}

Vernacular Names:

Assamese: Jain^{10,16,18}

Hindi: Ajwain, Jevain.^{9,10,15,16,18,19}

English: Bishop's weed^{9,18}, Ammi, Lovage, Carum, Ajwain, Ethiopian cumin^{4,15,16,19} omumseeds²⁰

Tamil: Omam.^{10,13,18,20}

Kannada: Oma, Yom, Omu.^{15,16,18,19}

Telugu: Vamu.^{15,16,18,19}

Bengali: Yamani, Yauvan, Yavan, Javan, Yavani, Yoyana, ajudan^{13,15,16,18,19,20}

Sanskrit: Yamini, Yaminiki, Yaviniki, Dipyaka^{15,16,19}

Malayalam: Oman, Ayanodakan.^{15,16,18,19}

Gujrati: Ajma, Ajmo, Yavan, Javain.^{15,16,18,19}

Kashmiri: Kath^{18,19}, jaavand.^{13,20}

Unani-Nankhawah, *Desi ajawaayin*^{13,15,16,19,20} *khomasoon*, *ayuneeqoon*, *absi*, *akhiloo*, *basaliqoon*.⁹

Arabic: kmoon maluki, ami^{9,13,14,18,20}

Sindhi: jaan^{13,20}

Synonyms:

T. copticum Link, *Carum copticum*¹⁹ Benth. & Hook^{18,21}

Temperament/Mizaj :

According to *Sheikh bu ali sina (Avicenna)* and *Jalinoos (Galen)* *garm o khushk* 3rd degree^{5,8,9,13,14,20} Few states that its *mizaj* is *garm o khushk* in second degree and few states that *garm o khushk* in last stage of 2nd degree²²

Dosage / Miqdar Khurak:

Fruit:

3-6g

Powder: 18,21

3-5 *masha/gram*^{13,20}

1-3 gram⁸

4-7, up to 10.5 *masha/gram*^{5,14,22}

Agroecology:

In India, it is found in arid open disturbed lands, lowland plains and mount in the waterless areas. The plant of *ajwain* is deficiency tolerant.⁶ It is native to Egypt and cultivated in Mediterranean region and in south-west Asian countries such as Iraq, Iran, Afghanistan, tropical Africa and Pakistan, China.^{5,16} *Ajwain* is chiefly produced in India as it

is extensively cultivated in Madhya Pradesh, Uttar Pradesh, Gujarat, Rajasthan, Maharashtra, Bihar and West Bengal.^{4,5,10,16}

Chemical Constituents:

The chemical composition of *ajwain* seed essential oil is influenced by various factors. Different parameters such as pressure, temperature, and modifier volume and extraction time have significant effect on the percentage yield and composition of *ajwain* oil.^{16,23} Phytochemical studies revealed that *ajwain* seed oil contained fiber (11.9%), carbohydrates (38.6%), tannins, glycosides, moisture (8.9%), protein (15.4%), fat (18.1%), saponins, flavone and mineral matter (7.1%) containing calcium, phosphorous, iron and nicotinic, cobalt, copper, iodine, manganese, thiamine, sodium, potassium, riboflavin^{4,5,10,15,16,17,24,25}

Thymol and essential oil (2-4%) present in the fruits are considered as the major constituents (35%-60%) of the plant.^{17,21} The nonthymol constituents which are present in *Ajwain* are paracymene, γ -terpinene, α - and β -pinenes, dipentene, α -terpinene, and carvacrol. Camphene, myrcene, and α -3-carene are present in small quantity in the plant.^{4,5,16,17}

Phytoconstituents in Different Plant Parts.²⁴

S.No.	Source	Phytoconstituents	Activity
1.	Seed	α -phellandrene, β -pinene, Cis-myrtanol, γ -terpinene, o-carene, α -pinene, p-cumin-7-ol, p-mentha-1,3,8 triene, Thymol, Carbohydrate, Glycosides, Saponins, Calcium, Flavones, Fiber, Moisture, Fat, Protein, Mineral.	Insecticidal, Estrogenic, Antiulcer, Antioxidant, Abortifacient, Antibacterial, Antihypertensive, Hepatoprotective.
2.	Fruits	3, 5-Dihydroxytoluene 3-O- β -D Galactopyranoside (glycosal compound), 1-(3-isopropylidene-2,2-dimethyl cyclopropyl)-isopropanone (Non terpenoids), Alpha-pinene, Alpha-terpinene, Beta pinene, Beta phellandrene, Carvacrol, Delta-3-carene, Gamma-terpinene, Paracymene, Styrene, Terpinene-4-ol (Non thymol), 2-Methyl-3-Buten-2-ol- β -D-Glucopyranoside, 7-Dimethyloct-3(10)-ene-1, 2, 6, 7-Tetrol 1-O- β -D-Glucopyranoside and 6-Hydroxythymol 3-O- β -D-Glucopyranoside.	Antifilarial, Analgesic, Antipyretic Antiinflammatory, Antifertility.

Organoleptic and Physicochemical Characteristics of *Ajwain* Powder.^{16,24}

Appearance	Powder
Colour	Light brown
Taste	Pleasant
Odour	Characteristic
Foreign matter(% w/w)	2.4
Loss on drying (LOD) (%w/w)	4.7
pH of 1% w/v solution	3.23
pH of 10% w/v solution	3.35
Total ash (%)	8.6
Acid-insoluble ash (%)	0.49
Water-soluble extractive	42
Alcohol-soluble extractive	17.9

Functions /Af'al:

Mudirr-i-bowl-o-Hayd^{9,13,20,22}

Musaqin^{8,9,20,22}

Mujaffif^{9,13,20,22}

*Musakkin riyah*⁹

Hazim^{8,13,26}

Kasir riyah^{8,13,20,22,26}

Mushtahi^{8,13,20,22,26}

Muhallil^{8,9,20,22}

Mufatteh sudda^{8,13,20,22}

Jalj^{8,13,20,22}

Dafa e tafun o tashannuj^{8,13,20,22}

Qatil mukhrij kirm o shikam^{8,13,20,22}

Tiryaq samoon^{8,13,20,22}

*Mukhrij balgham*²⁶

Uses /Istemaal:

- when used in the form of *safoof* and *matbooq* useful in *suye hazm*, *zofe hazm*, *zofe ishteha*, *nafakh* and *moghz reehi*.^{8,14,20} *shikam*, *uphaara*, *qararar shikam*, *dard shikam*, *waja ul fawaad*.¹³
- It is also used in *qoulanj*⁸, *shaheeqa*⁸, *eqtenaqur rehem*⁸, *ishaal wabayi*,⁸ *salabat jigar o tihaaal*.^{8,13,14,20}
- It is also used for *tasqeen* of *jigar o meda* of *sard mizaj* persons and *wabayi* diseases.^{8,13,20}
- Because of its *musaqin*, *muhallil* and *mufatteh sudda* properties used in chronic fevers.^{13,20} Accordingly '8 *pehri*

- ajwain* namely *nuqoo* is prepared in '8 *peher*' and used so.^{13,20}
- Used in *kaali khansi* and *amraaz tashannuji* because of its *musaffin*, *mujaffif* and *mufatteh* properties.^{13,20}
 - Beneficial in *falij* and *isterqa*.¹⁴
 - *Quwath bah*: when used dried after soaking 7 times in *arq leemu*.¹⁴
 - *Chark chashm* and *saqal samiya*: when used in the form of *joshanda* and dropped in eye and ear.^{14,16,23,24}
 - Beneficial in dysuria and bladder stones.^{9,14,17}
 - Works as diuretic, emmenagogue and galactagogue.^{13,14}
 - Beneficial in *tap rafa*.¹⁴
 - *Warm* and *pain*: when used all over body mixing with honey or *filfil*.^{9,14}
 - *Amraz jild*: used in *beheq*, *bars*, *muhaase*⁹, contusion in the form of *tila*.¹³
 - Increases blood pressure¹³
 - Used in side effects of *afjun*⁵ and alcohol.^{13,24}
 - *Rehem ka tanqiya*: when used as *dhuni* along with *zaft* and *ratneej*.⁹
 - Seed powder in mixture with ghee and raw sugar is used to clear out the uterus¹⁷
 - If its *joshanda* is poured on the part of scorpion bite it gives instant relief from pain.^{9,24}
 - Strengthens *gurda* and *masana*.^{9,14}
 - Hookworm: when used along with *shehed*.^{9,14}
 - The aqueous extract of the fruit is a popular remedy for diarrhoea in Indian medicine.²¹
 - *Pechish*: when used along with burnt *aqrot*.⁹
 - Boil one tablespoon of *ajwain* seeds in a glass of water, let it cool, then filter it known as *Ajwan ka araq* and drink it twice a day.^{23,24}
 - The ayurvedic pharmacopoeia of India recommends the dried fruits in tympanitis, constipation, colic and helimenthiasis.
 - Oil – used as expectorant in emphysema, bronchial and other respiratory ailments.
 - Used externally in cases of rheumatism.²¹
 - Heat one and half *masha/gram ajwain* and by placing it in a cloth and inhaling bring sneezes thereby reduces *nazla o zukham*.^{6,22,23,24}
 - *Nafakh* : when 3-6 *masha/gram* of *ajwain* is mixed with one and half *masha/gram kaala namak* and is drunk along with water.^{22,24}
 - *Zof hazima*: soak *ajwain* and *sonth* for 12 hours, grind, sieve, boil add salt and drink.
 - *Kasir riyah*, *dard nafakh*, *zof hazima*: grind *ajwain*, *kali mirch*, salt and drink with hot water.
 - *Tashannuj* : when flowers of *ajwain* and its oil are mixed and massaged.²²
 - Different researchers studied the oestrogenic content of *T.ammi* that are traditionally used to increase milk quantity in dairy cattle.

- *Ajwain* has also been traditionally used as a galactogue when seeds of *Ajwain* is fried in oil and used as a thin soup.⁴
- *Ajwain* is mixed with jaggery and warm ghee and taken orally to provide strength right after pregnancy.^{17,23}

Pharmacological Studies:

Antihyperlipidemic effect:^{16,4}

Javed *et al.*, subjected the chloroform, methanol, petroleum ether extract of *Trachyspermum ammi* against butter fed ad libitum and orally intubating cholesterol induced hyperlipidaemia rabbit models. The methanol and petroleum ether extracts at the dosage of 2 g/kg body weight powder were found to very effective against hyperlipidaemia in the models. It was found that petroleum ether extract produced more potent results in increasing HDL-cholesterol level and decreasing LDL-cholesterol level than that of methanolic extract. Also, petroleum ether extract helped in effective reduction of atherogenic index. Saleem *et al.*, reported the potent anti-hyperlipidemic activities of aqueous extract and methanol extract of the plant in triton induced hypelipidemia rat models. The study revealed that both the extracts at the dosage of 3 g/kg and 5 g/kg significantly reduced the levels of total cholesterol, triglyceride, and low-density lipoprotein along with the remarkable increase in the high-density lipoprotein concentration in serum.¹⁷

Antihypertensive, antispasmodic and bronchodilatory properties:^{15,16,10,24}

Intravenous administration of extracts of TA showed antihypertensive, antispasmodic and bronchodilating activity. The antispasmodic activity was found to be mediated through calcium channel blockade that supported the traditional use of TA in hyperactive disease states of the gut such as colic and diarrhoea as well as in hypertension. Thymol and different concentrations of the essence also exhibit a significant antispasmodic action on acetylcholine-induced contractions in isolated rat's ileum. The study suggested that relaxant effect of thymol is probably due to its anticholinergic property. In a study, boiled extract of *Carum copticum* exhibited bronchodilatory effect on asthmatic airways which was comparable with the effect of theophylline at concentrations used in asthmatic patients. The results of the study indicated an antitussive effect of *Carum copticum* which was even greater than that of codeine at concentrations used on guinea pig tracheal chains while it is also suggested that the antitussive effect of *Carum copticum* was not due to its main constituent, carvacrol.¹⁹

Anthelmintic Activity:^{16,24}

Anthelmintic activity of *T. ammi* shows its effect against specific helminths, e.g. *Ascaris lumbricoides* in humans and *Haemonchus contortus* in sheep. Anthelmintic activity of *T. ammi* exerts by interference with the energy metabolism of parasites through potentiation of ATPase activity and thus loss of energy reserves. The plant has also been reported to possess cholinergic activity with peristaltic movements of the gut, thus helping in expulsion of intestinal parasites which might also be a contributory factor to its anthelmintic activity.¹⁵

Anti-diarrhoeal activity:²⁷

T. ammi extracts of seed have potential at 100 mg/kg to control the diarrhoea. Its 95% total alcoholic extract and aqueous extract in experimental rats resulted a promising control in castor oil induced diarrhoea in concentration dependent manner. The total aqueous and alcoholic extracts

decreased the droppings of diarrhoea while comparing to castor oil group.²⁸

Anti-oxidant activity¹⁷:

Ajwain is also rich in vitamins and minerals and have health-promoting phytonutrients such as carotenoids (β -carotene and lutein) and flavonoids for providing powerful antioxidant protection. At 1 mg/ml acetone extract showed highest FRAP value ($2270.27 \pm 0.05 \mu\text{mol/l}$) as compared to aqueous and methanol extract of *ajwain* seeds and contribute a highly significant bio resource of antioxidants to be used in our day-to-day life and in food and pharmaceuticals. *T. ammi* methanol extract possesses strong antioxidant activity against DPPH, and could be used as natural antioxidant in food or pharmaceutical industry.²⁷

Insecticidal:^{4,24,28}

Some compounds extorted from plants have insecticidal action. Plant derived metabolites play a significant function in the plant-insect connections. Essential oil extracted from the seeds of *ajwain* reveals insecticidal activity in opposition to *Callosobruchus chinensis* in the ova-position step in addition to egg originate and developmental inhibitory actions⁶

Antiulcer activity:^{16,17,28}

Using different ulcer models, oregano *ajwain* ethanolic extract significantly reduced the ulcer index in pre-treated animals and also showed ulcer protection altogether models. Overall the extract reduced ulcerative lesions compared to the control group of the animal model.¹⁰

Abortifacients and galactogogic:^{7,16,24,28}

Actions of *Trachyspermum ammi* is listed in 14 indigenous medicinal plants that were reported to have been used for abortion in some districts of Uttar Pradesh (India) in their survey conducted in 1987. There was a high risk of potential human fetotoxicity of ten plants including *T. ammi*, based on teratogenicity observed in rat fetuses. The National Dairy Research Institute in India investigated the estrogenic content of some herbs (including *T. ammi*) that are traditionally used to increase milk yield in dairy cattle. *T. ammi* has also been traditionally used as galactogogue in humans. The total phytoestrogen content of dry *T. ammi* seed was 473 ppm, which was the second highest in the list of eight herbs tested (total phytoestrogen contents 131-593 ppm)¹⁵

Antiplatelet Aggregatory Activity:^{16,24}

Antiplatelet-aggregatory attempts out in vitro in human volunteers, and the document hooked up that the dried ethanolic extract of *ajwain* seeds suppressed the accumulation of platelets decreased by using collagen, arachidonic acid, and epinephrine¹⁶

Diuretic and anti-lithiasis activity:^{14,16,21}

Ajwain was attributed to have diuretic and anti-lithiasis activity in ethno-pharmacological reports. Accordingly, a human study was performed and in which, seeds of *Ajwain* were decocted in milk and given orally to volunteers suffering from urinary stone for a nine days period. The results were reported satisfactory against pure calcium-oxalate stone.¹⁹ *C. copticum* has been used in traditional medicine for relieving rheumatic^{6,19}, joint pain^{6,19}. Headache^{6,19} and neuralgic pain.^{6,19} a Dashti-Rahmatabadi *et al.* demonstrated that analgesic effect of ethanolic extract of *C. copticum* is comparable with morphine and this effect is suggested to be due to its parasympathomimetic through descending pain modulating pathways. Analgesic effect of *C. copticum* essential oil in formalin test was also assessed and pain scores were recorded during one hour (every 5 minutes).^{25,27,29}

Anti-inflammatory activity:^{15,16}

Aslam *et al.*, examined this property of *Trachyspermum ammi* different seed extracts prepared from hexane, chloroform and methanol solvents.¹⁷Thangam and ghananjayan observed anti-inflammatory potentials against rat models.⁴

Wound healing activity:

Gilani *et al.* found anti-bacterial potential of *ajwain* in healing of wound in rabbits by applying cream with 5% *ajwain* essential oil. They also compared it with iodine solution. Wound contraction at 15th day in *ajwain* group was 99.68% as comparable to healing by iodine solution and untreated group which was found to be 100 and 96.57% respectively indicating great healing power of *ajwain*.²⁸

Hepatoprotective:^{15,17,23,24,28}

The hepato-protective pastime of the methanolic extract of *ajwain* became said with the aid of the Gilani *et al.*, in that file it turned into showed that *Trachyspermum ammi* established in vivo hepato-protective pastime in mice approximately 80 per cent against a normally-LD of the paracetamol at a dose 1g/kg of body weight. The methanolic extract of *ajwain* additionally indicates preventive results towards CCl₄-accelerated continuation of drug pentobarbital sound asleep time, which confirms the hepato-protective interest of the extract other than it also balancing the extent of Alkaline Phosphatase (hepatic enzymes) and Aminotransferases (hepatic enzymes) all through the severe damaging circumstance of the liver.¹⁶

Estrogenist value: ^{24,25}

The phytoestrogen value was studied in *ajwain* seeds that revealed it is 473ppm.²⁷

Adverse Effect:

Trachyspermum ammi is an abortifacient therefore should not be used in pregnancy. In higher doses, it is toxic and may lead to fatal conditions.³

Dose and Administration Route:

Three to six grams of the seed powder with food or by means of other ways can be consumed daily. Although the seeds are small, they should be powdered for more effectiveness. In addition, it may be extracted or boiled and used. Dried extract of *C. copticum* seeds can be consumed up to 125 mg daily. The liquid extract (tincture) can be also consumed up to 6 mL daily.²⁹

Adverse effect according to unani/Muzirat:

musadda,^{8,13,14,20} *Garm mizaj* persons.²²

Corrective/Musleh: Dhaniya⁸

turmis, *Unnab*, *sard wa tar ajza*^{14,22}

Substitute/Badal: *kalonji*^{13,14,20,22} *Zeera siyah*.^{8,14,22}

Main Action /Nafa e khas : *mujaffif rutubat*, *meda kasir riyah*.^{13,20}

Compound Formulations /Murakkabath: *Arq Ajwain*

Majoon nankhawah

Majoon zabeeb^{8,13,18,20}

Relative Star/Nisbat sitara: *mansoob bamarj*, *azroye mizaj*.¹⁴

Conclusion:

Trachyspermum ammi, commonly known as "*Ajwain*," is a versatile plant with numerous medicinal applications and pharmacological effects. Studies indicate that it serves as a

rich source of biologically active compounds, exhibiting benefits in treating various health issues. This review discussed in detail about the nutritional value, phytochemistry, pharmacological actions, and therapeutic uses and also the pharmacological studies conducted so far on *ajwain*. In unani system of medicine *ajwain* has been commonly used as emmenagogue, appetizer, anti-inflammatory, antibacterial, digester, cleanser, supports functioning of respiratory system etc. This species exhibits numerous pharmacologically active compounds and has demonstrated various beneficial effects, including antifungal, antioxidant, antimicrobial, antinociceptive, antispasmodic, bronchodilating, anthelmintic, antitussive, hepato-protective, and anti-inflammatory properties.

Additionally, it has been employed for treating kidney stones, gastrointestinal issues, respiratory disorders, and gynecological concerns. However, caution must be exercised regarding its abortifacient action, as it can cause adverse effects if misused during pregnancy. Further clinical trials and meta-analysis are required to draw a definitive conclusion on the efficacy and therapeutic applications of *ajwain*.

Acknowledgements: The authors are extremely thankful to the Dept of Ilmul Qabalat wa Amraz Niswan and National Institute of Unani Medicine and hospital and its library staff for providing necessary materials for the review.

Conflict of Interest: Authors declare that there is no conflict of interest.

Funding: No source of funding

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