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DRUG REVIEW OF YAVANI (TRACHYSPERMUM AMMI)

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ABSTRACT

Mahabhaishaja is used for ahara dravya, which is crucial in treating different diseases. The traditional system of medicine plays an essential role in providing health care to mankind. Trachyspermum Ammi Possesses a great restorative value in Ayurveda medicine and culinary practices. Yavani is an annually growing plant widely distributed all over India has katu tikta rasa, laghu Deeksha, ruksha guna, ushna veerya katu Vipaka helps to cure diseases like grahani, gulma, Kasa, Anaha .yavani having Anti-spasmodic, Broncho-dilating, Hepatoprotective, Abortifacient, Anti-inflammatory, Antitussive effect, Anti-filarial, Gastroprotective, Hypo lipidemic pharmacological activities. Thymol is a dietary monoterpene phenol that is abundantly found in respect of Trachyspermum ammi; it averts menstrual cramps, enhances digestion by relaxing smooth muscles, devaluates respiratory problems, and is an active ingredient used in food flavorings, toothpaste, topical ointments, various soaps, deodorants and shampoos, mouthwashes.

Keywords: Brihatrayi, Yavani, Trachyspermum ammi, Pharmacological activities.

INTRODUCTION

Spices have been in use for centuries for both dietary and medicinal benefits. Yavani is one such aromatic Indian spice that is of the Apiaceae Family. It's indigenous to Egypt [1] and is farmed in India, Pakistan, Af-

ghanistan, Iraq, Iran, west Bengal, Rajasthan, Maharashtra, Gujarat, Bihar, Madhya Pradesh, and Uttar Pradesh are prime places where horticulture is done. Trachyspermum ammi is used for the executive of ophthalmic and ear infections. Management of Paralysis, Palsy, Tremor, and neurological disorders such as neuropathic pain and chronic pains are cited in Persian medical and pharmaceutical manuscripts [2, 3]. Seeds are effective against respiratory and gastrointestinal diseases. It is also disclosed as an aphrodisiac, galactagogic, and diuretic agent. Persian practitioners reported it is used for chronic fever, gripes [4], and the use of the fumigation form of Trachyspermum ammi seeds in female genital disorders. Topical decoction of seeds was noted as an analgesic agent for pain caused by a scorpion's bite.[5] The seed has been proven to have several biological activities, which are analgesic, anxiolytic, anti-corrosive, and laxative, as well as for abdominal pain and hemorrhoids [6]. The seed has 2-4% oil. One of its essential components is thymol, a polyphenol compound with antiseptic, anti-flatulent, antifungal, anti-aggregatory effects and antibacterial activities. It is a source of antioxidants.

BOTANICAL NAME: Trachyspermum ammi

NATURAL ORDER: Apiaceae

CLASSICAL NAMES: Yavani, Yamani, Deepyaka, Bhahmadarbha, Yamanika, Yavasahavya, Yavanika, Yavahavha, Bhumikadamba.

<table>
<tr><td>  </td><td>  </td></tr>
<tr><td colspan="2">Inflorescence</td></tr>
<tr><td colspan="2">  </td></tr>
<tr><td colspan="2">Fruits</td></tr>
<tr><td>  </td><td>  </td></tr>
<tr><td>Trachyspermum ammi fruits</td><td>Leaves</td></tr>
</table>

DISTRIBUTION:

Almost throughout India on a commercial scale particularly in Uttar Pradesh, Madhya Cultivated Pradesh, Bihar, West Bengal, Gujarat, Rajasthan, Maharashtra and Andhra Pradesh. A native of Egypt and cultivated in the Mediterranean region, South Mexico, Costa Rica, North-East Africa, Europe, South-West Asian Countries such as Iraq, Iran, Afghanistan and Pakistan and Baluchistan. Also grown as a plantation crop in Australia, Hawaii, Philippines, Sri Lanka, South Africa, Tropical America and South Easter Asia.

PARTS USED: Fruit, leaf, root.

ACTIONS AND USES:

Fruits possess carminative, stimulant, tonic, and antispasmodic properties and are used in diarrhea, atonic dyspepsia, cholera, colic, flatulence, indigestion, sore throat, and bronchitis. A paste of the crushed fruit is applied externally for relieving colic pains; hot and dry fomentation of the fruits on the chest is a common remedy for asthma. It is also used in the preparation of lotions and ointments. It is antiseptic, aromatic, used in nasal catarrh and skin diseases, mouthwash, deodorant, toothpaste as an expectorant, and emphysema, bronchial pneumonia, and other respiratory ailments. It is also used for perfuming disinfectant soaps and as an insecticide. Externally, oil is used in rheumatism. Roots are diuretic and carminative and are used in febrile conditions and stomach disorders. Leaf juice is anthelmintic.

In classical texts:

➢ **Yavani mentioned in Charaka Samhita**

- Cha. Chi. Arsha chikitsa[7] -

1. Patha combined with Yavani, Duralabha, and Bilwa, alleviates the Arsha.

2. Yavani Cavya, trikatu, path, yavaksara, dhanyaka, pippalimula, Bida, citraka, bilwa, and haritaki should be powdered together with four times dadhi Helps for vata anulomana, This Ghrita alleviates Arsha, Gudabramsha, grahani, pravahika.

3. Yavani, sushi patha, Dadima rasa, Guda mixed with chakra should be administered for vata anulomana.

- Cha. Chi Kasa. chikitsa [8] Yavanika alleviates the five types of coughs.
- Cha. Chi .Trimarmiya chikitsa [9]_- Churna of citraka, hingu, mamsi, and yavani, all in equal parts, are powdered and mixed with triphala, two parts—this formulation taken with madya, yusha for gulma and ashmari.
- Cha. Chi. Udara chikitsa[10] – yavani is a prime drug mentioned in Narayana churna, which is indicated for udara, gulma, and vataroga.
- Cha.si .Snehavyapasiddi[11] Yavani is used for anuvasana basti cures sarva vata vikara.
- Cha. Si. Uttarabasti siddi[12] yavani is used to make niruha basthi, which plays a vital role in Emaciated persons and those suffering from Tuberculosis, Old persons, help in chronic piles, and Persons desirous of progeny.
- Cha. su .shadvirechana shatashritiya[13] yavani is drug of sheetaprashamana gana.

➢ **Yavani mentioned in Sushruta Samhita.**

- In Doshadhatumalakshayavruddhivigyaniyadhyaya[14,] the shaka of Yavaka dravya is called yavani.
- In Mishrakadhyaya, yavani[15] is called Ajagandha.
- In Dravyasangrahaniyadhyaya[16] ajamoda is called as yavani.

➢ **Yavani mentioned In Astangahridaya.**

- In udara chikitsa[17,] yavani is the prime drug mentioned in Narayana churna, which is indicated for udara, Gulma, and vataroga.
- In kasa chikitsa[18,] lehya is used, in which yavani is one of the drugs which alleviates kasa.

➢ **In Sharanghadara samhita[19]**

It is mentioned as pittavaradana, agnivardhana and indicated in hrudhya, kusta, shula.

In Nighantu's

Nighantu	Udara	Krimi	Gulma	Chardi	Anaha	Hridya
Bhavaprakasha[20]	✓	✓	✓	×	✓	×
Raja[21]	✓	✓	×	✓	×	×

Dhanwantari[22]	✓	×	✓	×	×	×
Kaiyadeva[23]	✓	✓	✓	×	×	✓
Madanapala[24]	✓	✓	✓	×	×	×
Priya[25]	✓	✓	×	×	×	×

- **Doshaghnata** – Kaphavatashamaka, Pittavardhaka.
- **Rogaghnata**- Kaphavatajavikara, Shotha, Charmaroga, Vrishchikadansha, Vrana, Adhmana, Shitapitta, Aruchi, Agnimandya, Ajeerna, Anaha, Amavata, Sandhishoola, Udarashoola, Gulma, Pleeha, Krimi, Dantaroga Galashundika, Arsha, Hriddaurbalya, Jeernakasa, Shwasa, Visuchika, Udara, Mootraghata, Kashtartava, Sutikavikara.
- **Karma** -

Vedanasthapana, Shothahara, Anulomana, Jantughna, Vishaghna, Rochana, Deepana, Krimighna, Vatanulomana, Hridayottejaka, Jwaraghna, Shoolaprashamana, Shleshmaputihara, Shwasahara, Shukranashana, Mootrajanana, Stanyanashana, Garbhashayottejaka, Swedajanana, Sheetaprashamana.

Doses:

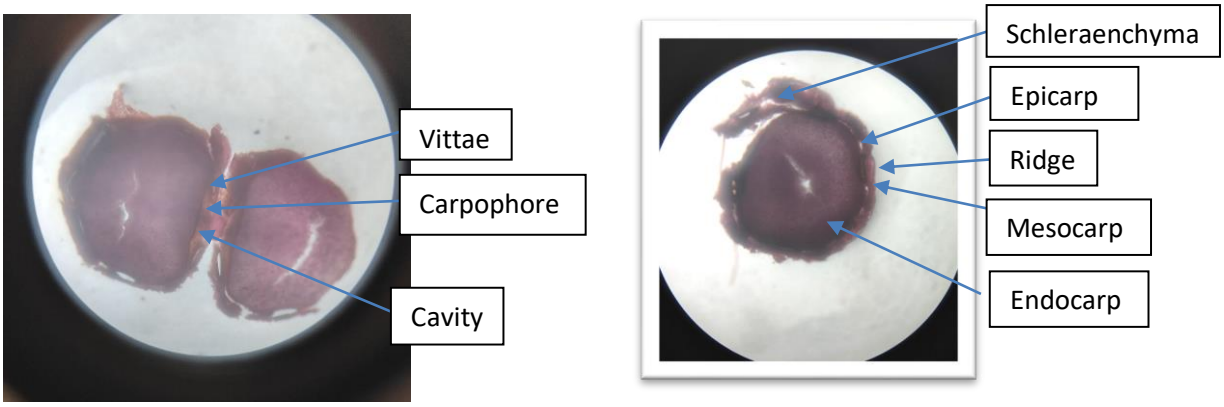
- Powder-1- 3 gm
- Oil- 15-30 ml
- Extract- 30-120 mg
- Arka- 20-40 ml.

Macroscopic:

Fruit occurs mainly as entire Cremo carps with pedicel attached or detached at the base and bifid stylopod at the apex, broadly ovoid, 1.5 to 3 mm in length and 1.2 to 2.8 mm in width, yellowish green, dorsal surface convex with five distinct longitudinal ridges in each mericarp, surface warty, commissural surface flat, showing two darker longitudinal bands representing the vittae. The aromatic odor tastes slightly bitter initially, becoming intensely pungent and producing slight numbness to the tongue and macroscopic structure.

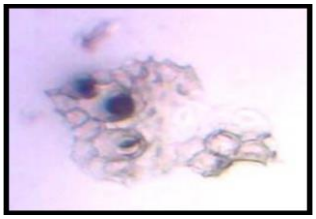
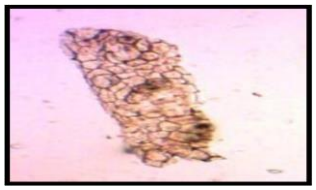
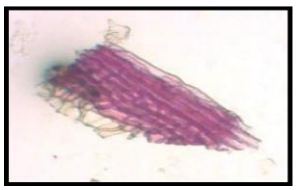
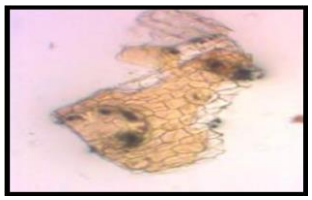
Microscopic:

The diagrammatic TS of the fruit shows five strongly developed primary ridges, each with a vascular bundle, four large vittae on the dorsal surface, and two on the commissural surface, where lies raphae in between the endocarp and testa layer. The Diagrammatic LS of the fruit shows a cylindrical embryo embedded in the endosperm towards the apical portion of the fruit. Epicarp consists of a highly papillose epidermis, interrupted at places with warty unicellular trichome like dome shaped bulging extensions, with striated cuticle; mesocarp parenchymatous; vascular bundle bicollateral, encircled at the base with pitted and reticulate lignified parenchyma; vittae broad, measuring 150 to 200 µ in width, µ lined with dark brown epithelium layer, innermost layer of the mesocarp somewhat collapsed, endocarp composed of unequal sized tangentially running thin-walled parenchymatous cells; testa layer very broad; cells of the endosperm, thick-walled, parenchymatous and filled with oil globules and aleurone grains embedded with micro rosette crystals of calcium oxalate.



Powder microscopy:

Shows epicarp in surface view with cuticular striations, numerous colourless, irregular fragments of endosperm with thick-walled cells containing oil globules and aleurone grains embedded with micro- rosettes crystals of calcium oxalate, fragments of yellow or brownish septate vittae in surface view, groups of vascular strands cut longitudinally, associated with reticulate and pitted parenchymatous cells, unicellular, small simple trichome like papillose extension of the epicarp; characteristically arranged endocarp cells, in surface view.

		
(A) Endocarp in surface view	(B) Detached protuberance	(C) Microrosette crystals
		
(D) Striated cuticle in surface view	(E) Pitted fibres	(F) Endosperm containing micro rosette crystal of Ca-oxalate

Powder analysis of T.ammi fruits

Physical constants:

- Foreign matter- Not more than 5 %.
- Total ash- Not more than 9 %.
- Acid insoluble ash- Not more than 0.2%.
- Alcohol soluble extractive- Not less than 2 %.
- Water soluble extractive- Not less than 13 %.
- Volatile oil- Not less than 2.5 %

CHEMICAL CONSTITUENTS:

Camphene, A³-carene, carvacrol, P- cymene, dipentene, myrcene, a- and B- pinenes, phenol, alpha - and B-phellandrenes, y-terpinene, thymene, thymol, linoleic, oleic, octadecanoic, palmitic, petroselinic acids, resin acids; nicotinic acid, riboflavin, thiamine, protein, sugars, tannins, flavone and sterol (fruits); phenolic glycoside, phenolic galactoside, 3-galactosyloxy-5- hydroxytoluene, galactose, ß-methylgalactoside, 2-methyl-3-glucosyloxy-5- isopropylphenol (seeds); cadinene, longifolene, camphor, carvone, p-cymene, B- pinene, D-limonene (herb oil); isothymol, p-cymene, thymol, limonene, y-terpinene (essential oil); Elemol, a-cadinol, 8-cadinene caryophyllene, muurolol, B-cudesmol, ß-elemene, a-humulene (whole plant).

PHARMACOLOGICAL ACTIVITIES:

Antimicrobial, antibiotic, diuretic, antiseptic, pesticidal, anticholinergic, inhibitory activity against hepatitis C virus (HCV) protease, antifungal, nematocidal, antihypertensive, anti-spasmodic, broncho-dilating, hepatoprotective, abortifacient, anti-inflammatory, anti-tussive effect, anti-filarial, gastro-protective, hypolipidemic, anti-helminthic.

TOXICOLOGY:

Thymol produced from Yavani oil is toxic in high doses which may lead to fatal poisoning. Essential oil and total oil caused marked fall in blood pressure in cats and had low toxicity.

Toxicity dose – 2294 mg/Kg

THERAPEUTIC EVALUATION:

The administration of a compound herbal preparation of Trachyspermum ammi was done in 40 patients of gastritis, twice daily after meals, showed marked to satisfactory improvement in 85 percent patients. Trachyspermum ammi oil (essential oil) was subjected to tropical testing in the form of ointment on patients. An ointment containing oil was found to be effective in reducing the infection of ringworm.

FORMULATIONS CONTAING YAVANI

Formulations	**Uses**	**Reference**
Yavanyadi churna	Vibhanda, Kasa, Grahani	As.H.Chi Dravyadi vigyaniya [55-57]
Dadimadya ghrita	Basthishoola, prameha, mutraghata	B.R.Pramehadikara 37/104
Vaiswanara churna	Vibhanda, Amavata, Udara	As.H.chi Dvividha upakramaneeya/34
Sudarshana vati	Jwara, Gulma, Pleeha	B.R .Jwaradhikara 5/439
Yogaraja guggulu	Amavata, Gulma, Pleeha, Krimi	B.R. Amavatachikitsa 29/152
Nrupativallabha rasa	Amadosha, agnimandya, Grahani, atisara.	B.R. Grahani rogadhikara 8/351
Changeri ghrita	Arsha, Grahani, pravahika	B.R. Grahani rogadhikara 8/559
Phala ghrita	Yonidosha, Garbhasthapana, Pumsavana, Medhya	As.H. Guhya roga pratiseda 34/63-67
Devadarvarishta	Grahani, Prameha,Kusta,Mutrakruchra	B.R.Pramehadikara 37/
Yamanikadi kwatha	Amadosha,agnimandya	B.R. Grahani rogadikara 8/10
mahashatphala ghrita	Krimi pleeha ajeerna udara grahani	B.R.Grahani rogadikara 8/567
Takrarista	Shotha,gulma,arsha,krimi	B.R.Grahani rogadikara 8/609
Agnimukha choorna	Arsha, gulma, shwasa, kasa , ajeerna, pleeha ,udara.	B.R.agnimandyadirogadikara 10/62

TRADE AND COMMERCE[26.]

Commodity	**Yavani**
Average market price	₹15366.67/Quintal
Minimum market price	₹11900.00/Quintal
Maximum market price	₹19400.00/Quintal

Price updated: 29th November 2023.

SUBSTITUTES AND ADULTERANTS:

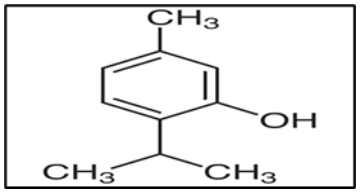
Commercial samples of Yavani are often found adulterated with earthy matter and seeds of Makara. The seeds are mostly adulterated by ban yavani [Seseli diffusum (Roxb. ex. Sm.)] or randhuni [Apium graveolens (Linn.) Sprague].

PROPOGATION AND CULTIVATION[27]:

- According to soil and climatic conditions raising practices of Yavani differ to a certain extent in many parts of India. The crop is grown in cold weather, both as a dry crop and irrigated crop. It is also grown as a rainfed crop in heavy soils. It grows on all kinds of soil but does well on clay or loams. For dry crops, the black cotton soils, which store the moisture of the earlier heavy rains, are suitable. For the irrigated garden crop, the soil is reduced to a fine tilth by ploughing or digging and by breaking the colds. The field is weeded and heavily manured. The sowing period extends from September-November.
- Seeds are sown broadcast in the moist soil at the rate of 2.3-3.5 Kg per hectare. Germination takes 5-15 days, depending upon climatic conditions. After sowing light irrigation is given immediately and also with two weedings regularly followed. At the time of the first weeding, the plants are thinned, and the stands made uniform by planting blank or wide spaces. The flowering takes place in about two months. The harvesting period extends from February-March. The fruits become ready for harvesting when the flower heads turn brown.
- The plants are then pulled out by the roots and dried on mats on the threshing floor. When completely dried, the fruits are separated by carefully rubbing with hands or feet. A good crop yields 330- 350 Kg of fruit per hectare. The herb is not affected by many diseases and pests. Collor and root rot caused by Sclerotium rolfsii is reported. The plant is treated with common fungicides and stored in paper bags at room temperature (26-37°) and relative humidity of 11.6-83.8% resulted in increased germinative percentage of the fruits.
- In an efficient protocol for plant regeneration from shoot-tip explant of Trachyspermum ammi was obtained using solid as well as liquid media. Complete plantlet formation via shoot-tip excised from germinated seedlings on MS medium supplemented with NAA (1.0 mg-1) and BAP (5.0 mg-1) was achieved. On solidified medium, multiple shoots were produced on BAP (8.0 mg-1) and IAA (3.0 mg-1) and rooted individually on IBA (5.0mg-1). However, on liquid medium, shoots were produced on BAP (0.5-1) and IAA (7.0 mg-1), separated at the base and rooted individually on solidified medium with IAA (3.0 mg-1).
- **Pesticides[28]:**
  1. Spraying of Neem Seed Kernel Extract (NSKE) @ 5 % or Neem oil 2% effectively cheek the early population build-up of aphids on the crop.
  2. Application of entomopathogen Verticillium lecanii (108spores/g) powder formulation @5.0 g/lire of water give good result.
  3. At high aphid population any one of the synthetic insecticides should be sprayed i.e Dimethoate 0.03%, Metasytox - 0.03%, Emamectin benzoate @ 10 g a.i/ha, or Imidachlorprid - 0.005%.

YAVANI SATVA (Thymol) [29]:

Yavani satva (Thymol) is a crystalline phenolic component, chemically 2 isopropyl-5-methylphenol) obtained from the volatile oil of Thymus vulgaris L. and Trachyspermum ammi (L.) Sprague (Fam. Lamiaceae).



Thymol

- **DESCRIPTION:**

Colorless crystals or white, crystalline powder; odor pungent and aromatic, thyme like; taste, pungent and aromatic.

- **Identification:**

A solution in alcohol (90 per cent) is optically inactive. Heat 1 g of the test sample in a test-tube in a water-bath with 5 ml of a 10 per cent w/v solution of sodium hydroxide; a clear, colorless or pale-red solution is formed which becomes darker on standing, but no oily drops are separated. On adding a few drops of chloroform and agitating the mixture, a violet colour is produced.

Dissolve a small crystal of the test sample in 1 ml of glacial acetic acid and add 6 drops of sulphuric acid and 1 drop of nitric acid; the liquid shows a deep bluish green colour when viewed by reflected light. It sinks in cold water and when the temperature is raised to about 45^0 it melts and rises to the surface.

IDENTITY PURITY AND STRENGTH:

Melting range:	Between 48° and 51°
Non-volatile matter:	Not more than 0.05 percent
Acidity or alkalinity:	4w / v solution in alcohol (50 per cent) is neutral to litmus solution.

CONCLUSION

Yavani is one of the universal drugs having good remedial properties. Widely used in various Ayurvedic formulations. Yavani is Kaphavatashamaka, Pittavardhaka, mentioned under shulaprashamana, shatapushpadi varga, pippalyadi varga, aushadi varga, haritakyadi varga which cures diseases like Gulma,Anaha,Udarashoola,Kasa,Krimi ,and It contains potential dietary components and antioxidants which helps in prevention of diseases.

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