

VYAGHRI HARITAKI: A DRUG OVERVIEW

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ABSTRACT :

Respiratory illness comprises a large proportion of pediatric patients attending clinics and hospital. Cough, coryza, breathlessness are major complaints of respiratory ailments. *Vyaghri haritaki* is an ayurvedic preparation for cough, cold, coryza, breathlessness, etc. It is mentioned in reputed book of ayurvedic pharmacy, Bhaisajya Ratnavali. It also finds a place in ayurvedic formulary of India. The effectiveness of the drug can be attributed to the pharmacological properties of its individual components. This articles reviews the chemical constituents and the experiment based pharmacology of contents of *Vyaghri Haritaki*.

Key words: *Vyaghri haritaki, Kantakari avaleha, Trikatu, Chaturjata*

What is already known about this topic:

Vyaghri haritaki, an ayurvedic formulation is described by various treatise of ayurveda. It is prepared in the dosage form of *Avaleha*, a semisolid drugs form which can be licked. The drug mainly acts on *Kasa* and *Shwasa* which include diseases causing cough and breathlessness like coryza, bronchial asthma, bronchitis etc.

What does this study add: This article overviews the drug and its components with a reference to their pharmacodynamic properties.

INTRODUCTION: According to a WHO survey, about 70-80% of world population relies on non conventional herbal medicine for their primary health care. Ayurvedic texts describe many herbal formulations for *Kasa* (cough), *Peenasa* (coryza) and *Shwasa* (breathlessness), *Vyaghri Haritaki*, one of them. *Avaleha* is the semi-solid dosage form¹ of ayurvedic medicines having long shelf-life.² *Vyaghri haritaki avaleha* is described in treatise Bhaisajya Ratnavali and Chakradutta.^{3,4} It is also included in Bhava Prakash, Yoga

Ratnakara, Gada Nigraha, Vanga Sena, Bharat Bhaisajya Ratnakara and API.

INGREDIENTS OF VYAGHRI HARITAKI:

The ingredients of *Vyaghri Haritaki* are *Kantakari* (1 tula/5 Kg), *Haritaki* (100 pieces of medium size), *Trikatu* (2 pala /96 gm each of *Shunthi, Maricha, Pippali*), *Chaturjata* (1 pala/ 48 gm each of *Ela, Twaka, Twakapatra, Nagkeshara*), *Madhu* (6 pala/288gm) and *Purana Guda* (100 pala/4.8kg)⁵

PROPERTIES OF INDIVIDUAL DRUGS:

The properties of individual drugs of the formulation, *Vyaghri Haritaki* are as follows:

HARITAKI

Haritaki consists of the pericarp of mature fruits of *Terminalia chebula* Retz. (**Fam. Combretaceae**), a moderate sized or large tree found throughout India, chiefly in deciduous forests and areas of light rainfall upto about 1500 m elevation, throughout India, flowers appear from april to august and fruits ripen from october to january.⁶

Chemical constituents: Tannins: Astringent substance (30%) containing chebulinic acid and tannic acid, gallic acid and anthraquinone, Chebulin

Pericarp - Arjungenin, Arjun glucoside

Fruit - Arjunolic acid, Chebulagic acid, Chebulic acid, Chebupentol, Corilagin, Daucosterol, Ellagic acid, Gallic acid (1.21%), Punicalagin, Quercetin, Terchebin, Terchebulin

Seed oil - Behenic acid,

Stem bark - Bellericoside, Chebuloside, Oxalic acid

Leaf - Maslinic acid, Micromeric acid, Punicalin .

Pharmacodynamical study:

- Alcoholic extract (Gallic acid and its ethyl ester) was potent against methicillin resistant strain of *Staph.aureus*.⁷

- Gallic & Chebulagic acid: Humoral immunity was enhanced and cell mediated response was stimulated.⁸

- *T.chebula* exhibited antispasmodic action of smooth muscle similar to that of papverine.⁹

- Hydrolyzable tannins are available in *T.chebula* which show antimutagenicity in *Salmonella typhimurium*.¹⁰

- *T.chebula* shows cytoprotective effect same as *Asparagus racemosus* on gastric mucosa.¹¹

SHUNTHI

Shunthi consists of dried rhizome of *Zingiber officinale* Roxb. (Fam. *Zingiberaceae*), widely cultivated in India, rhizomes dug in January to february. English Name for it is ginger root.

Chemical Constituents:

Essential oil (1-3%) with camphene, cineol, citral, phellandrene, borneol, Zingiberene, Gingerols, Shogaol,

Zingerone, Furanogermerone. Rhizome contains essential oil and oleoresin.

Pharmacodynamical study:

- Ginger suppresses phthalate ester-induced airway remodelling¹²

- Ginger suppress Th2-mediated immune responses and might thus provide a possible therapeutic application in allergic asthma¹³

- Gingerols – Antitussive. 6-Shogaol administered intravenously showed strong antitussive effect when compared to dihydrocodeine phosphate¹⁴

- Ginger augmented the serum corticosterone level, which induce anti-inflammatory activity¹⁵.

- Anti-inflammatory: It acts by inhibiting prostaglandin synthesis.

- Gingerols act as general inhibitors of lipoxygenases and affect by interacting with prostaglandin synthetase¹⁶.

MARICHA: *Maricha* consists of fully mature dried fruit of *Piper nigrum* Linn. (Fam. *Piperaceae*); a climber, cultivated from Konkan Southwards, especially in North Konkan Kerala, and also in Assam.

Fruits ripen from december to march, depending upon climatic conditions; fruits harvested from december to april. Its english name is 'Black Pepper'.

Chemical Constituents : Alkaloids (Piperine, Chavicine, Piperidine, Piperetine), Essential Oils. (Himalaya-Clinically important plants of India.)

Pharmacodynamical study:

- *Trikatu* is used in combination with honey to alleviate diseases such as colds, rhinitis, cough, breathlessness, asthma, dyspepsia and obesity¹⁷.

- Warm saline gargles of *Trikatu*, steam inhalation and fomentation help in relieving cold symptoms.¹⁸

PIPPALI: Pippali consists of the dried, immature, catkin-like fruits with bracts of *Piper longum* Linn. (Fam. *Piperaceae*), a slender, aromatic climber with perennial woody roots, occurring in hotter parts of India from central Himalayas to Assam upto lower hills of West Bengal and ever green forests of Western ghats as wild, and also cultivated in North East and many parts of the South. Its English name is Long Pepper.

Chemical Constituents:

Piperine, Piplartine, Pipernoline, Piperundecalidine

Roots -Piperolactam A & B, Piperadine, Aristolactam A– II

Fruit -Eicosadienamide, Eicosatrienamide, Guineensine, Longamide, Octadecadie, Piperlongine, Piperlongumine, Pellitorine, Piper Piperidine alkaloid I, Piperide, Piperundecalidine (alkaloid); Essential oil - Carveol, Cymene ; Terpinolena, Thujene, Zingiberene

Stem - Piperaltine, Seed - Sylvania (alkaloid)

Pharmacological actions:

- Milk extract is effective against antigen induced bronchospasm. Crude extracts containing alkaloids suppress cough reflex.
- Anti allergic activity - Fruit effectively reduced passive cutaneous anaphylaxis in rats and protected G.pigs against antigen induced bronchospasm. 30 % protection of mast cells was seen in in vitro¹⁹.
- Piperine - Decreases the rate and amplitude of respiration²⁰.
- Piperine increased respiratory rate and antagonised morphine and pentobarbitone induced respiratory depression in dogs²¹.

- Plant Extracts (Pet.ether extract) in small doses stimulated respiration in cardio-respiratory centre and antagonised morphine or pentobarbitone induced depression.

- Piperine had a more prolonged action against respiratory depression induced by pentobarbitone and morphine. The clinical use of piperine in treating respiratory depression due to narcotic poisoning may be useful.²²

- Crude alcoholic and water extract and Piplartine (alkaloid) suppressed the ciliary movements of frog oesophagus (the alkaloid is more active) suggesting that the effect in relieving cough could be due to suppression of cough reflex.²³

- *Pippali Rasayana* has shown immuno-stimulatory activity in mice. It induced significant activation of macrophages as evidenced by increased macrophage migration index (MMI) and phagocytic activity²⁴.

KANTAKARI: Kantakari consists of mature, dried whole plant of *Solanum surattense* Burm. f., Syn. *Solanum xanthocarpum* Schrad . & Wendl , (Fam. *Solanaceae*), perennial, very prickly diffused herb. Its english name is Febrifuge plant.

Chemical Constituents : Glucoalkaloids solanocarpine, solanine-S, solasodine, solasonine, solamargine, and sterols.

Pharmacodynamical actions:

- *S.xanthocarpum* is non toxic and has been reported to be safe for human use²⁵

- *Kantakari* decoction (whole plant) was reported to have significant late suppression of induced immunological oedema, indicating suppression of cell mediated immunity²⁶.

- It has also been reported for antianaphylactic activities and antiandrogenic activities^{27,28}

- Its chloroform extract has been reported as an antioxidant²⁹.

- The plant has been reported beneficial in the treatment of asthma and chronic bronchitis³⁰.

- In a clinical study, it was reported that oral administration of *S. xanthocarpum* at a dose of 300 mg dry powder thrice a day for 3 days found to be very effective to controlling mild to moderate bronchial asthma and the bioactivity is equivalent to that of administration of 200 mg of deriphylline³¹.

SUKSMAILA (ELA) *Suksmaila* consists seeds of dried fruits of *Elettaria cardamomum* (Linn.) Maton and its varieties (Fam. *Zingiberaceae*), a stout large perennial herb, growing naturally in moist forests of western ghats up to 1500 m, also cultivated in many other parts of south India at an elevation from 750-1500m. Its english name is cardamom.

Chemical constituents: Volatile oil, starch, nitrogenous gum, cineol, limonene, terpineol.

Pharmacodynamical actions:

Ela shows pharmacological actions like hepatoprotective, anti inflammatory, analgesic, antispasmodic, antimicrobial and antifungal.³²

NAGAKESAR *Nagakesar* consists of dried stamens of *Mesua ferrea* Linn. (Fam. *Guttiferae*), an evergreen tree, about 15-18 m high with short trunk, often buttressed at the base, occurring in the Himalayas from Nepal eastwards, Bengal, Assam, evergreen rain forests of North Kanara, Konkan, forests of Western Ghats and Andhra Pradesh. Its english name is Cobras Saffron, Ceylon Iron wood.

Chemical constituents: Mesuol, essential oil, oleoresin, mesuaferone A, mesuaferone B, guttiferol, ferraxanthone.

Pharmacological actions: *Messua* species is shown to have membrane-stabilising activity, which is the possible mechanism for its anti-inflammatory action.

TVAKA: *Tvaka* is the dried inner bark (devoid of cork and cortex) of the shoots of stem of *Cinnamomum zeylanicum* Blume. (Fam. *Lauraceae*), a moderate sized evergreen tree usually attaining a height of 6-7.5 m, cultivated on the Western Ghats and adjoining hills, bark collected during April-July and October-December. Its english name is Cinnamon bark.

Chemical constituents: Tannin, mucilage, bark oil contains cinnamaldehyde, eugenol, benzaldehyde, pinene, cymene, nonylaldehyde, cinnamic aldehyde.

Pharmacological Actions:

- Antioxidant activity is shown by alcoholic extract and bark oil of *Cinnamomum*.

- Antimicrobial action is shown in bark powder and root oil, found to be effective against *Bacillus subtilis*, *Staphylococcus aureus* and *Pseudomonas aeruginosa*.

- Anti-inflammatory action of bark oil and oil from twigs of *Cinnamomum*.

TVAKPATRA: *Tvakpatra* consists of dried mature leaves of *Cinnamomum tamala* (Buch. Ham.) Nees & Eberm. (Fam. *Lauraceae*), a small evergreen tree upto 7.5 m high and occurs in tropical, subtropical Himalayas between 900-2300 m, often raised from seeds, sown in nursery, leaves collected in dry weather from about ten years old plant during October- March. Its english name is Indian Cinnamon.

Chemical constituents: Essential oil, cinnamic aldehyde, eugenol, d-phellandrene

Pharmacological Actions:

- Leaf oil has anti-phagocytic activity and anti septic properties.
- Leaf oil has also shown to have anti-fungal and anti cancerous activity.

JAGGERY (GUDA)

Chemical Constituents :Jaggery contains : Moisture 3.6%, Sucrose 65.85%, Invert sugar 10-15%, Ash-2.5%, Protein 4% Mineral matter 6%, Calcium 80 mg/100 gms, Phosphorus 40 mg/100 gms, Iron 11.4 mg/100 gms. It also contain Carotene, Vit. A, 2810 IV, Thiamine 0.02 mg, Nicotinic acid 10 mg/100 gram.

Jaggery is rich in minerals, iron & instant glucose. It is not only easily digestible but has various minerals & vitamins in right proportion, which is extremely useful for our body. Nutrient contents of Jaggery (per 100 gms)

MADHU (HONEY)

Chemical Constituents:Dextrose 32 - 37 %, and Sucrose 0.4 - 0.6%, Moisture 13 - 20 %, small quantities of other carbohydrates, volatile oil, pigments and plant parts especially pollen grains. It also contains vitamin B, B2, B6, C and Nicotinic acid in traces. It also contains minerals like Potassium, Magnesium, Calcium, Iron, Copper, Sulphur, Chloride, Phosphorus, Chromium, Nickel, Silver etc.

Pharmacological Action:

- In children with nighttime cough, honey appears to offer symptom relief and improve sleep quality, according to a study funded, in part, by the Honey Board of Israel³³.
- Honey could lower blood sugar and improve the renal hepatic & bone marrow functions and lipid profile. It decreases S.

Cholesterol, S. LDL, S. Triglyceride & increase S. HDL level. Honey has antibacterial properties due to its acidic nature and enzymatically produced hydrogen peroxide. Constant use of honey strengthens the white blood corpuscles to fight bacterial and viral diseases. As it contains sugars which are quickly absorbed by our digestive system and converted into energy, this can be used as instant energizer. As it is hygroscopic, it speeds up healing, growth of healing tissue and dries it up. Honey acts as a sedative and is very useful in bed wetting disorders. It is also a very good anti-oxidant which restores the damaged skin and gives soft, young looks.

- Antibacterial properties of honey are the result of the low water activity causing osmosis, chelation of free iron, its slow release of hydrogen peroxide, high acidity, and the antibacterial activity of methylglyoxal³⁴.

- Honey appears to be effective in killing drug-resistant biofilms which are implicated in chronic rhinosinusitis.

CONCLUSION: Vyaghri haritaki is an age old drug for respiratory illness which is practised till date. The pharmacological actions of the formulation and its constituents are largely supported by experimental evidence. Thus the drug is an ancient remedy standing the test of contemporary science.

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