



## Pharmacological activities of Kahruba (*Vateria indica* Linn.)— A literary review

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### ABSTRACT

*Kahruba (Vateria indica Linn)* is a resin used in Indian medicine as a tonic, carminative and expectorant. The resin exuded by the tree is known as Piney resin, White Dammar or Dhupa. *Vateria indica* Linn is an Indigenous & Endemic plant species to the Western Ghats. The tree belonging to the family Dipterocarpaceae is distributed mainly in the southern Western Ghats in evergreen and semi-evergreen forests, along streams. *V. indica* was described by Hook in 1874 and Gamble in 1915 many workers have since reported it from different parts of Southern Western Ghats in India from the states of Kerala, Karnataka and Tamil Nadu and a 'Tree flora of Kerala' 2 listed 26 other reports concerning *V. indica*. It has also been reported from Myristica swamps of Uttara Kannada and Southern Kerala. Traditional medicine & Astrological sciences too yield references which make us understand its bondage with the culture and tradition of the country. The plant can be found described in almost all Unani literatures in the treatment of chronic bronchitis, anaemic disorder, ear disorder, skin disorder, gonorrhoea, syphilis, urinary discharges, amenorrhoea, piles, and diabetes mellitus along with this it has various pharmacological activities such as anti-inflammatory, anthelmintic, anti-ulcer, anti-tumor activity and anticancer. *Vateria indica* (Linn.) is a Critically Endangered tree endemic to the South Western Ghats, India.

**Keywords**— *Kahruba, Vateria indica* Linn, Resin, Endangered plants, Unani medicine, White dammar

### 1. INTRODUCTION

Kahruba (*Vateria indica* Linn) is a large evergreen tree that belongs to the Dipterocarpaceae family. It is a multipurpose plant which has economic and medicinal importance. <sup>(1)</sup> Resin from *V. indica* is known as white 'dammar'. Apart from medicinal uses, it has long been used as incense, and for making varnishes. It is obtained by cutting notches in the tree when it exudes and gradually hardens. <sup>(2)</sup> The resin which is extensively used in Indian medicine is credited with tonic, carminative and expectorant properties. *Vateria indica* Linn, an endemic plant species to peninsular India, highly appreciated for its aromatic resin, Timber, Tallow etc., is at threat in its own land. <sup>(3)</sup> The black variety of *vateria* is obtained from the *Canarium strictum*. The bruised and boiled seeds yield solid fat 49.2 p.c., which resembles the solid fats of *Gracinia* and *Bassia*. It is a greenish yellow colour which bleaches rapidly on exposure to light with Balsamic odour <sup>(4)</sup>



#### 1.1 Botanical classification

The botanical classification is done in the following ways. <sup>(4,5)</sup>

Kingdom	Plantae
Family	Dipterocarpaceae <sup>(4,5)</sup>
Genus	<i>Vateria</i>

<b>Species</b>	V. indica
<b>Synonyms</b>	V.malabarica Bl. <sup>(4)</sup>

## 1.2 Vernaculars

<b>English</b>	White Dammar, Indian Copal Tree <sup>(4,5,11)</sup>
<b>Arabic</b>	Misbah-ul-room <sup>(7,8,9)</sup>
<b>Persian</b>	Kahrubashamayi <sup>(7,8,9)</sup>
<b>Unani</b>	Raal <sup>(5)</sup>
<b>Hindi</b>	Kahruba, Sapheddamm <sup>(4,9)</sup>
<b>Tamil</b>	Kungiliyam, Vellai Kunderakam, Vellaikuntirikkam, <sup>(5)</sup>
<b>Telugu</b>	Telladamara, Dupadamaru <sup>(4,6)</sup>
<b>Sanskrit</b>	Ajakarua <sup>(4,6)</sup>
<b>Malayalam</b>	Vellappayin, Velutta Kunturukkam <sup>(4,6)</sup>
<b>Kannada</b>	RalaBilagaggala, Hugadamara <sup>(6)</sup>

## 1.3 Mahiyat (Description in Unani literature)

Kahruba is the gum of the plant.<sup>(7,8,9)</sup> The plant is a large evergreen tree and is found in Russia, Bulagaria. According to Avicena the gum is similar to sandroos and is reddish white and bright in colour.<sup>(9)</sup> Two varieties are found Kahrubanabti and kahrubaroomi in which roomiis consider the best. It has a peculiar feature i.e. power of absorbing or attracting grass and particles. It gives an odour of lemon on rubbing. It is bitter in taste. <sup>(7,8,9)</sup>

<b>Mizaj (Temperament)</b>	Balanced
<b>Muzir (Adverse effect)</b>	A headache
<b>Musleh(Corrective)</b>	Banafsha <sup>(7,8,9)</sup>
<b>Miqdar e khuraaq (Dose effects)</b>	1masha -3masha <sup>(8)</sup> or 2.15gm <sup>(9)</sup>
<b>Badal (Substitute)</b>	Sandaras <sup>(7,8,9)</sup>
<b>Parts used</b>	Bark, resin ,oil <sup>(6)</sup>
<b>Parts studied</b>	Gum <sup>(7,8,9)</sup>
<b>Propagation</b>	By seeds <sup>(6)</sup>

## 1.4 Afaal (Functions): <sup>(7,8,9)</sup>

- Haabis-e-dam
- Qabiz
- Mujaffif
- Mubarrid
- Astringent
- Daafe ishaal
- Mundammil qurooh
- Mufarre wa muqawwi qalb
- Muqawwi meda wa jigar

## 1.5 Iste'mal (Therapeutic use):<sup>(7,8,9)</sup>

- Kasratetams,
- Ruaf,
- Bawaseerdamvi,
- Khafqan ,
- Diarrhoea,
- Yarqan,
- Amrazechashm,

**Action:** Resin-astringent, antibacterial, antidiarrhoeal, emmenagogue

Used for chronic bronchitis, piles, skin eruptions, ringworm, scrofula, tubercular glands, ulcers, wounds, boils; urinary discharges; amenorrhoea; gonorrhoea and syphilis. <sup>(5)</sup>

The resin along with little quantities of Jaggery is given to treat Spruemixed with Sesamumoil, it is given in Gonorrhoea, and with Ghee and long pepper for the treatment of Syphilis and Ulcers.

Sesame oil cooked with gruel & 1/4<sup>th</sup> part of the Resin, after churning with water is prescribed in Fevers, Abdominal disorders & burning sensation. <sup>(3)</sup>

**Bark:** Anti-dysenteric.

**Oil and resin:** Antirheumatic.

**Resin** enters into a number of antiseptic and anti-inflammatory ointments.

**Leaves:** Juice is applied to cure burns. Orally administered to prevent vomiting. <sup>(5)</sup>

### 1.6 Photochemistry

The bark contains polyphenols-dl-epi-catechin, levorotatory isomers of fisetinidol, fzelechin; and bergenin. The resin is a complex mixture of several triterpene hydrocarbons, ketones, alcohols and acids, along with small amounts of sesquiterpenes. On distillation, the oleoresin gave an essential oil (76%), consisting of phenolic constituents and azulenes. The essential oil shows marked antibacterial activity against Gram +ve and Gram -ve micro-organism. The leaves and roots contain bergenin and hope phenol. The seed also contains bergenin. The fruit shell contains 25% tannins.<sup>(5)</sup>

### 1.7 Ethanobotanical description

A large elegant evergreen tree, grows up to 30m high, with a clean, cylindrical bole of 15m. and a girth of 4.5m.<sup>(10)</sup> A large softly pubescent, climbing or training herb with 5-angled hispid stems and 2-fid long tendrils; leaves simple, long-petioled with two glands at the apex, 5-lobed, cordate, dentate, hairy on both surfaces; flowers large, white, solitary, the males long-stalked and the females short-stalked; fruits large spherical bottle or dumb-bell shaped, rind woody when ripe enclosing soft juicy flesh; seeds many, white compressed smooth with amarginal groove.<sup>(11,6)</sup>

### 1.8 Habitat and Distribution

In the Western Ghats upto 1200m long the streams<sup>(5)</sup>. It extends in Western Ghats from N. Kanara to Tranvancore up to 3500 or 4000 ft., chiefly in evergreen forests, but occasionally along rivers in deciduous forests. In Coorg both in the Ghat forests and east of the Ghats up to 3,500ft., in the latter locality always in evergreen forest.<sup>(11)</sup>

## 2. PHARMACOLOGICAL ACTIVITIES

### 2.1. Anti-inflammatory activity<sup>(1)</sup>

The chemical screening of leaves of *Vateria indica* were performed as per the guideline of the World Health Organization (WHO). The anti-inflammatory activity screening of the various extracts showed the presence of alkaloids, carbohydrates, steroids and glycosides. Anti-inflammatory activity was performed using the carrageenan induced rat paw oedema method. The ethanolic extract (400 mg/kg, p.o.) showed 36.9% inhibition and compared to the standard drug diclofenac sodium which showed 55.6% inhibition. Conclusively the result revealed that *Vateria indica* leaves have an anti-inflammatory activity which may be due to the presence of alkaloids, steroids and glycosides

### 2.2. Anti-tumour effect<sup>(1)</sup>

Dipterocarpaceous plants contain various resveratrol oligomers that exhibit a variety of biological activities, such as antibacterial and antitumor effects. The antitumor activity of the ethanol extract from the stem bark of *Vateria indica*, which has been traditionally used for health and healing diseases. High-performance liquid chromatography analysis showed that the extract contains bergenin, hopeaphenol, vaticanol B, vaticanol C, and epsilon-viniferin. The extract did not show significant toxicity to mice even at a dosage of 1000 mg/kg body weight by daily oral administration for 28 days. These results demonstrated that the ethanol extract containing various stilbenoids from the stem bark of *Vateria indica* has the potent antitumor activity.

### 2.3. Anthelmintic activity<sup>(1)</sup>

The crude ethanolic extract of *Vateria indica* significantly demonstrated paralysis, and death of worms at a concentration 50mg/ml compared to standard reference mebendazole.

### 2.4. Anti-ulcer activity<sup>(1)</sup>

*Vateria indica* resin extract in the higher dose (500mg/kg) witnessed a significant dose-dependent anti-ulcer activity against ethanol-induced gastric ulcer and indomethacin-induced gastric ulcer models. It also produced a significant (\*\*p<0.01) reduction in the ulcer index on a higher dose (500mg/kg) as well as standard (ranitidine) treated groups. The study revealed that *Vateria indica* Linn. resin extract possess significant anti-ulcer activity.

### 2.5. Anticancer potential<sup>(1)</sup>

In the present study, the anticancer potential of stem bark of *Vateria indica* against two cancer cell lines namely, rat glioma (C6) and EAC was tested. Alcoholic and aqueous extract of stem bark of *Vateria indica* exhibited considerable cytotoxic activity against the cell lines in the preliminary screening. But not all fractions of the extract were active against the cell lines. Acetone, ethanolic and petroleum ether showed active cytotoxicity in cancer cells, the rest of the fractions were not active. Based on the present study it can be concluded that *Vateria indica* possesses anticancer activity.

### 2.6. Antioxidant and anti-mutagenic activity<sup>(12)</sup>

*Vateria indica* stem bark extracts contain a good amount of phenolic and flavonoid content and can be used as a natural source antioxidant and antimutagenic agents that could have great importance as therapeutic agents in preventing or slowing the progress of aging and age associated oxidative stress related degenerative disease.

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