

**FLORA OF CONCERN
ENDANGERED MEDICINAL PLANTS - PART I
VATERIA INDICA LINN, DIPTEROCARPACEAE – A REVIEW**

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ABSTRACT

Herbal medicine in India is resurrecting with a huge demand, with a number of new pharmacies sprouting out in the due course of time. Though the situation is promising to the Herbal practitioners, the increase in consumption of the flora in the name of medicine, timber etc. critically affects the Biodiversity, there by drawing a plenty of indigenous plants to the endangered species list released by the International Union for Conservation of Nature. Sarja (*Vateria indica* Linn.) is one such Indigenous & Endemic plant species to the Western Ghats, which requires an urgent attention to be conserved. On critically analyzing the status of *Vateria indica* Linn. It was found to be over exploited & highly felled for the purpose of making Plywood's. Datas reveal that a shocking rate of around 6200 tons of timber per annum was being used for the same purpose in the late 1960's. Traditional medicine & Astrological sciences too yield references which make us understand its bondage with the culture and tradition of the country. This study is being undertaken to bring about awareness among the Herbal practitioners & Environmentalists to take Voluntary measures in conserving such Red listed plants, so that it would be made available to the generations to come. "*Nature creates, human preates & only humane protects*".

KEY WORDS: *Vateria indica* Linn., Sarja, Tallow, Resin, Endangered plants, Ayurveda, Conservation

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INTRODUCTION

To be on the Herbal medicine front, mere utilization of plants in medicine would sound low when the drug is already threatened for existence. So a path breaking step would be to protect such plants from becoming extinct in the near future, which would serve the generations to come. It becomes our sole responsibility to highlight such endangered species, which would help the herbal practitioners, conservationists and Environmentalists to narrow down their cynosures to such indigenous plant species, thereby ensuring safety to the country's flora from being swept off by threatening Catastrophes.

An antique plant species known to ancient Indians is at the verge of Extinction. Rapid Industrialization has led to an uncontrollable increase in Human interference to play a spoilsport, which has resulted in a considerable decline of its habitat. *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. Delineated as one of the critically endangered species in the red list of International Union for Conservation of Nature (IUCN Red list - August 2010), needs an urgent attention for Conservation. Sarja as it is termed in Ayurveda, Raala in Unani, Vellai Kungiliyam in Siddha systems of medicines, is highly preferred in Local healing traditions for curing many diseases.

Age old Astrological sciences in India, have considered this plant to be sacred, which finds a Niche for itself in 'Nakshatra Vana'(group of plants specific to birth stars) and accredited as the plant to be worshiped for Moola Nakshatra. Down the ages people have been exploiting this plant for various purposes, which have led to a heavy loss of its Habitat especially in the 19th century. The onslaught of Plywood industries has proven to be continuously destructive in pushing this plant to the critically endangered list.

Since times immemorial, the aromatic resin is utilized for the preparation of Medicines & Incense, which seem not to have caused a threat to its survival. The resin is as such of a low quality & cost when compared to the high quality resins extracted from another plant *Canarium strictum* (Black Dammar), utilized for the same purpose. Although the Economic value of *Vateria indica* Linn finds no short comes, as it yields one of the best timbers too.

Hence, an attempt has been made here to bring such drugs under the lime lights, of which *Vateria indica* Linn marks the first step, which needs a high concern. Let us see this plant with further more details.

VATERIA INDICA LINN. (SYN: VATERIA MALABARICA, CHLOROXYLON DUPADA)

(Table 1)

English:	White Dammer Tree, Piney Resin tree, Indian Copal Tree
Sanskrit:	Sarja, Ajakarna,
Hindi:	Safed dammar
Thamizh:	Vellai Kungiliyam, Vellai Kundurikam, Paini pisin,
Malayalam:	Vella-Kundurukkam, Paini pasha
Kannada:	Dhoopada mara, Bili Dhoopa

Red List category & Criteria

Critically endangered, A1cd version 2010. 2.

Assessor & Year Assessed

Ashton P., 1998

Habitat, Ecology & Geographic Range

A slow-growing species, Endemic & found primarily in the South west coast evergreen forests, upto an altitude of 750 m, and also occasionally in secondary evergreen dipterocarp forest in the states of Karnataka, Kerala & Tamil Nadu.

Population

Although the status of this species is critical, few healthy populations remain.

Threats

The timber has been overexploited, particularly for the plywood industry. An average of about 6,200 tonnes of timber annually (in the year 1960) was yielded by felling the trees in Western Ghats, which were utilized for plywood making. Loss of habitat and other human activities have also contributed to population declines.

Conservation Actions

Some populations are contained in forest reserves. Trees are being planted on a small scale and replantation efforts are being made in some degraded rainforests and barren areas.

Regeneration & Viability

Regeneration is said to be good where allowed, hence adequate protection of areas from clearance and degradation could allow it to make a recovery. Seeds fall close to the tree and germinate readily; they are sensitive to drought & frost. Both shade and moisture are necessary for their survival. Artificially could be propagated by direct sowings or by transplanting entire plant along with the ball of earth. Stump planting does not give satisfactory results. Seeds are viable for about a month and have a good germinative capacity upto 80%.

MORPHOLOGY

A large elegant evergreen tree, grows up to 30 m. high, with a clean, cylindrical bole of 15 m. and a girth of 4.5 m.

Bark: Rough, whitish to grey, peeling off in thick round flakes.

Leaves: Coriaceous, Ovate to Oblong, entire (Leaf falls in March, new foliage appears in April-May, the second flush of foliage starts after rains, in October to December.)

Flowers: White, fragrant, in terminal Corymbose Panicles (Flowering – January to March)

Fruits: Capsules, ovoid, pale brown, fleshy, 8 to 11cm long, and 3.5 to 6 cm in Diameter. 1 seeded, reddish white, filled with fat. Ripens during June to July.

ECONOMIC IMPORTANCE

Timber

The timber is in much demand for commercial first class plywood making. The bulk of this drug is obtained from the forests of Coimbatore district in Tamil Nadu, Kerala & Karnataka. It is sold in the name of "*Malabar White Pine*". It has been found to be equivalent to *Oregon Pine* of USA.

Resin

Piney Resin, White Dammar or Dhupa of Commerce is obtained from this tree. Mainly used in making home Varnishes, Incense sticks, Torches & candles with coconut oil. Also finds extensive use in Indian medicine, which is described later.

The Resin comes in 3 forms:

1. Compact form: Solid lumps and regarded as the best quality. It is very hard and bright orange to dull yellow, with a vitreous fracture, and amber like appearance.
2. Cellular form: Full of air bubbles and gives a cellular structure.
3. Dark-coloured form: Occurs in cavities of old and moribund trees or dead trees and of an inferior quality.

Tallow

Piney Tallow, Malabar Tallow or Dhupa fat

In the traditional method of extracting the Dhupa fat also called as Piney Tallow, the seeds are crushed and boiled in water till the melted fat rises to the surface, which is semi-solid in consistency. The same fat is also extracted by hydraulic press which yields high. The Tallow is used for edible purposes after refining, used in confectionary and as an adulterant of ghee. Also been suggested for use in blends with cocoa butter or as its substitute. The fat is being used in making candles and Soaps.

PHYTOCHEMISTRY

The bark is reported to be containing *Polyphenols – dl – epi-catechin, laevorotatory isomers of fisetinidol, fzelechin and bergenin.*

The leaves and roots contain *bergenin* and *hopeaphenol*.

The seeds also contain *bergenin*.

The fruit shell contains 25% *tannins*.

High-performance liquid chromatography analysis showed that the extract contains *bergenin, hopeaphenol, vaticanol B, vaticanol C, and ε-viniferin.*

MEDICINAL PERSPECTIVE – IN GENERAL

Tallow

It is used as an Emollient, Stimulant, Antibacterial & useful application in chronic rheumatism.

Bark

Acrid, used as an alexipharmic.

Leaf

Juice is applied to cure burns and is also used in diseases of blood.

Resin

Credited with Tonic, Carminative & Expectorant properties and used in several diseases, such as Throat disorders, Cough, Chronic bronchitis, Piles, Diarrhoea, Rheumatism, Tubercular glands, Boils etc.

MEDICINAL PERSPECTIVE: AYURVEDA

The drug *Vateria indica* Linn. can be found described in almost all Ayurvedic literatures with the name Sarja, Sarjaka, Ajakarna.

Indications

Kaphaja roga, Pandu roga(Anaemic disorders), Karna roga(Ear disorders), Meha(Diabetes mellitus), Kushta(Skin disorders), Visha(In Poisoning), and in Vrana(Wounds).

The Ayurvedic Pharmacopoeia of India recommends the resinous exudates internally (1-2 g) in Obesity & lipid disorders, Anaemia, Genitourinary diseases, Diarrhoea and diseases due to vitiated Blood; externally in Gout, Abscesses, Skin diseases, Burns, Eruptions.

Dosage

Resinous exudate – 1 to 2 gms.

Therapeutics

- Mixed with Sesamum oil, it is given in Gonorrhoea, and with Ghee and long pepper for the treatment of Syphilis and Ulcers.
- An Ointment of the resin with Wax and the fat of *Garcinia indica* is said to be effective in Carbuncles.
- The resin along with little quantities of Jaggery is given to treat Sprue.
- Sesame oil cooked with gruel & 1/4th part of the Resin, after churning with water is prescribed in Fevers, Abdominal disorders & Burning sensation.
- Powder of the Resin mixed with Rock Salt, honey & Mustard oil is used as an external application to treat Cracks in the foot.

Formulations

- Sarja rasadi Malaharam
- Devadaru Guggulu
- Aparajitha Dhumam
- Vrana Churnam
- Pinda Tailam
- Chitrakaadya Gutika
- Svarjikadi tailam

RECENT RESEARCHES

Recent Researches on different parts of the plant of *Vateria indica* Linn. shows the following pharmacological actions.

- The Ethanolic extract of the Stem Bark is said to possess various Stilbenoids which exhibit a potent anti-tumour activity.
- In vitro studies of the extracts of this drug have shown promising Anti-cancerous activity, against mouse Sarcoma.

CONCLUSION

Vateria indica Linn., an indigenous & endemic plant of the Peninsular India, reputed for its medicinal properties, excellent timber, resin & tallow, is at the verge of extinction. Conservation is an affordable measure as the regeneration capacity of the plant is promising. Though the Forest Departments & Conservationists are trying to make their best in its protection, Physicians dedicated for medicinal plant studies along with NGO's should take initiatives to plant the saplings of this plant in Schools, Colleges, Parks, temple premises, avenues etc., which are artificial reserves and would assure its safety growth, there by serving the purpose and preventing it from extinction in the near future.

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Table 1

Kingdom	Phylum	Class	Order	Family
PLANTAE	TRACHEOPHYTA	MAGNOLIOPSIDA	THEALES	DIPTEROCARPACEAE



Figure 1: *Vateria indica* – Swollen leaf base



Figure 2: *Vateria indica* – Inflorescence



Figure 3: Fresh resin (1 day old)



Figure 4: Oxidised Resin

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