



## A literary study on kamala (*Nelumbo nucifera*)-a brief review

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### Abstract

Nala (*Nelumbo nucifera*) is a well-known plant in traditional medicine. It is extensively defined, reflecting its great medicinal importance, in almost all the Samhita and Nighantu's of Ayurveda. Ayurvedic doctors have been widely involved in the treatment of a range of diseases across the years. Kamal botanical name is *Nelumbo nucifera* (*Nelumbium speciosum* Wild syn.) from the Nelumbonaceae family. It is a constant aquatic herb with prominent flowers of red lotuses. The result is miraculous and the properties are anti-haemorrhages. Robininin and glucoside contain in the flowers and Leaves include alkaloid, asmilobine and irinidine nuciferin.

**Keywords:** samhita, nighantu, nala etc

### Introduction

*Nelumbo nucifera* is also known as holy lotus, Indian lotus, Bean of India, or simply lotus. It is India's national flower. It is associated with divinity, fertility, prosperity, wisdom, and enlightenment. It is a kind of aquatic plant. Flowers are lovely, fragrant, and have a lot of petals and stamens [1]. It can be found all over India in lakes and other bodies of water. Its root has been dipped in clay. [2] The leaves are glossy and have a diameter of 30-100 cm. Flowers occur when the plant reaches a height of 30-35 cm and a diameter of 10-15 cm. *Nelumbo nucifera* is primarily a nutrient, particularly in the form of seeds. Seeds contain 17.2% protein, 2.4 percent fat, and 66.6 percent carbohydrate, as well as calcium, phosphorus, iron, ascorbic acid, and glucose [3-5]. Surya - vikashi flowers bloom in the morning and close in the evening. It is beneficial in a variety of bleeding conditions because it reduces Pitta dosha. It helps in the development of the embryo.

### Synonyms

*Ambhoruha, Kusesaya & Sarasa Pankeruha Padma Nalina Rajiva Satapatra & Sahasrapatra Tamarasa Bisaprasuna*

### Aim & Objectives

To evaluate the study of *Kamala (Nelumbo nucifera)* in human body

### Methodology

The material is composed from numerous articles, texts, *Samhitas*, internet or authentic website sources, etc.

### Classification

Kingdom *Plantae*  
Division *Magnoliophyta*  
Class *Magnoliopsida*  
Order *Proteales*  
Family *Nelumbonaceae*  
Genus *Nelumbo*

### *Species Nelumbo nucifera*

#### Review of a Classic

Acharya Charak refers to *Kamal* in the *Mutraviranjniya Mahakasaya*, [6] *Kamal* is in *Utapaladi gana* in the *Susurut Samhita*. In *Astang sangraha*, *Kamal* is named in *Pittaghna gana*, *Anjanadi gana*, *Priyangvadi gana*, and *Ambashthadi gana* [7], and in *Astang Hridyam*, *Kamal* is mentioned in *Pittaghna gana*, *Anjanadi gana*, *Priyangvadi gana*, and in *Ambashthadi gana*. In *Pushpavarga* [8], *Bhavprakash Nighantu* wrote about *Kamal*. In *Karviradi varga*, *Raj Nighantu* included *Kamal*. It is stated in *Aushadh varga* by *Kaidev Nighantu* [9]. In the *Karviradi varga*, *Dhanvantari Nighantu* explains *Kamal* [10]. It is classified as *Sammishra varga* by *Mahaushadi Nighantu*. In *Kakolyadi gana*, *Anjanadi gana*, and *Utpaladi gana*, *Susruta Nighantu* mentioned *Kamal*. [11]

#### Variety in *Kamal*

Acharya Bhavmishra identified three types of *Kamal* based on their colour: red, white, and blue, all of which have the same properties. *Pundareeka* refers to the white variety of *Kamal*, while *Koknada* refers to the red variety and *Indivera* refers to the blue variety. The white type (*Pundareeka*) outperforms the others [12]. *Shweta patra*, *Sharad*, and *shambhu vallabh* are *Pundareeka*'s synonyms. *Pundareeka* is beneficial to the *Pitta* and *Rakta doshas*. *ArunaKamal*, *Raktaambhoja*, *Shanpadma*, *Raktoutapal*, *Arvinda*, *Ravipriya*, and *Raktavarija* are all synonyms for *Koknada*. It is beneficial to *Vata*, *Pitta*, *Kapha*, and *Rakta disorders*. *Utapal*, *Neelaabj*, *Neelpankaj*, and *Neelpadma* are all synonyms for *Indivera*. For the *rasayana karma* listed in *Raj Nighantu*, *Indivera* is the highest. It is used to strengthen the muscle. *Padma* is a slightly white *Kamal*, *Utapal* is a light blue *Kamal*, and *Nalin* is a slightly red *Kamal*, according to *RajNighantu*. These three forms are used to treat fatigue, fainting, and heart disease [13]. *Nelumbium nucifera* has two varieties: white and pink, according to modern

classification. Blue isn't a *Nelumbium nucifera* variety; it's a lily called Kumud in Ayurvedic literature <sup>[14]</sup>.

### Botanical Description <sup>[15]</sup>

The word *Padmini* was coined by Acharya Bhavmishra to describe *Kamal's* root, stem, leaves, fruit, and blooming flower. *Padmini* balances the doshas of Pitta, Rakta, and Kapha. *Kamal* aggravates Vata dosha due to its properties Sheetal (cold), Guru (heavy), Madhura (sweet), Lavana (salty), and Ruksha (dry). Ayurvedic texts use various words for different portions of *Kamal*. Samvartika refers to new *Kamal* leaves, Karnika to seed cases, Kinjalaka to *Kamal* kesar, Makarand to *Kamal* pushpa rasa, MriNala and Bisa to *Kamal Nala* (stem), and Shaluk to *Kamal* Kanda, according to Acharya Bhavmishra (rhizome).

### Morphology

The sacred lotus is a rhizomatous annual aquatic plant that grows in the mud at the bottom of shallow rivers, wetlands, lagoons, marshes, and flooded fields. On 1-2 m long petioles, the broad peltate (leaf - stalk attaching to the centre rather than the edge) leaves rise above the water level. Lotus reaches a height of 150cm and has a horizontal range of 3m. The showy flower can be up to 20cm in diameter and the leaves can be up to 60cm in diameter. The fruits are a conical pod of seeds enclosed in hales <sup>[16-18]</sup>.

### Leaves <sup>[19]</sup>

Both types of leaves are huge. Aerial and floating orbicular leaves are 20–90 cm in diameter, abruptly acute to form a short tip, petiolate, whole glaucous, non-wettable, Solid cupped in aerial leaves & smooth in floating leaves, radiately nerved, the fresh leaves are leathery, but after drying they are nearly membranous and brittle, and there is more or less brownish red blotching on the lower surface. The aerial leaves' petioles are tall and stout, while the floating leaves' petioles are weak. Aerial leaves are usually 24–33 cm long, while floating leaves are 23–30 cm long. Smooth, greenish or greenish brown petioles with small brown spots.

### Seeds and Fruits <sup>[20]</sup>

Fruit is made up of indehiscent nutlets that come together to form a whole. Ripe nutlets are ovoid, roundish, or oblongish in shape, up to 10cm long and 1.5cm wide, with a smooth, brownish or greyish black pericarp that is faintly longitudinally striated, pedunculated, and one seeded. The mature carpe is full of seeds. *Nucifera* fruits have a strong dormancy capacity.

### Flowers

Solitary, broad, 10-25cm in diameter, fragrant peduncles arising from the nodes of the rhizomes, sheathing at the base, 1-2 cm long, green or blakish green, hard & stout, smooth or rough due to the presence of numerous tiny spaced prickles, sepals, petals, and stamens are spirally arranged <sup>[21]</sup>

### Rhizomes <sup>[22]</sup>

Rhizomes are 60-140 cm long, 0.5–2.5 cm wide, yellowish white to yellowish brown in colour, flat, longitudinally striated with brown spots, and have nodes and internodes. When sliced raw, it exudes mucilaginous juice and reveals a few big cavities followed by many others.

### Phytochemistry

*N.nucifera*, also known as Lotus and *Kamal* in Hindi, is a member of the Nelumbonaceae family. The presence of alkaloids such as nuciferine, neferine, lotusine, isoliensinine, quercetin, isoquercitrin, and flavinoids has been identified throughout the plant. *Nucifera* seeds contain 2-3 percent fat, and is made up of myristic, palmitic, oleic, and linoleic acids. Lotus leaf contains a number of flavonoids and alkaloids, with flavonoids being one of the most essential ingredients. Isorhamnetin, kaempferol, quercetin, quercetin-3-O—Dxylopyranosyl-1,2—D-glucopyranosyl glycosides, astragalol, chrysoeriol-7-O—D-glucoside, isoquercitrin, and hyperin are among the eight flavonoids and glycosides isolated from lotus leaf in a recent report. The flavonoids found in lotus leaves attract the most interest and are studied the most, since they have a wide variety of biochemical and pharmacological properties. Leaves and petioles were used to separate nor-nuciferine (I), nuciferine (II), remerine, remerine (III), and arnepavine (IV). <sup>[23]</sup>

### Distribution

Floodplains, rivers, streams, pools, lagoons, marshes, swamps, and the backwaters of reservoirs are among the shallow (up to around 2.5 m deep) wetland environments found in warm-temperate to tropical climates. It can be seen all over Eastern Asia. It comes from India, Japan. <sup>[24]</sup> It can be found all over India, including the northwestern Himalayas, Kashmir, West Bengal, Bihar's central and southern regions, Orissa, Maharashtra, and much of South India's districts.

### Cultivation

The Lotus (*Nelumbo nucifera* Gaertn.) is one of 12 marine species used as a vegetable that has been cultivated for over 2,000 years and is now extensively cultivated. *Nelumbo* grows as an emergent aquatic plant at the edges of still lakes and wetlands, as well as in slow-moving waterways, in water up to 2 metres deep. Ponds and tanks are popular places for it to expand. Sweet-scented berries, edible fruits, and rhizomes are all common uses for this herb. Rhizomes are the most common way to disperse the plants, but seeds may also be used. In the months of March and April, rhizomes are cut into small parts and planted with buds just above the soil surface. Ensuring that there is enough water in the pond or pool before October is a priority <sup>[25]</sup>.

### Pharmacological Effects and Ayurvedic Properties

*Kamal* is Kasaya (astringent), Madhura (sweet), Tikta (bitter) in Rasa (taste); Laghu (light), Snigdha (unctuousness), Picchila (lubricous) in Guna (Properties); Sita (cold) in Virya (potency); Madhura (sweet) in Vipaka (sweetness) (metabolism). It is used to treat Kapha-Pitta dosha, as well as Mutavirajaniya (urine discoloration). Worms are removed, biliousness, vomiting, and strangury are relieved <sup>[26]</sup>.

*Kamal* has Sheeta (cold) potency and Madhura (sweet) flavour, according to Bhavprakash *Nighantu*. It treats Kapha and Pitta-related ailments. It works as a blood coagulant and heart tonic. *Kamal* has Sheeta (cold) potency and Madhura (sweet) flavour, according to Raj *Nighantu*. Raktapitta (bleeding disorders), Sharampida (tiredness), Bham (dizziness), and Santap (fever) are some of the conditions for which it is prescribed <sup>[27]</sup>.

**Formulations and Preparations** <sup>[28]</sup>

- *Prasarini taila*,
- *Lakshdya taila*,
- *Arvindaasava*,
- *Mahachandana taila*,
- *Raktapittakulakandana rasa*,
- *Pancharavinda ghrita*,
- *Brihadgokshuradyavaleha*,
- *Shatavaryadi ghrita*,
- *Ashwagandha taila*
- *Prapoundrikadya ghrita*
- *Prapoundrikadya taila*

**Medicinal Plant Part Uses**

The whole plant is used medicinally, with the exception of the buds, nuts, tuber, and stamens.

**A complete plant:** worms are removed; thirst, fever, biliousness, vomiting, and strangury are relieved.

**Root Part:** The bitter root relieves cough and biliousness, quenches thirst, and cools the body. The powdered root is used as a demulcent for piles, as well as dysentery and dyspepsia. It's used as a paste to treat ringworm and other skin conditions.

**Stem Part** is beneficial in the treatment of strangury, blood complaints, dehydration, and leprosy.

**Leaves Part** are bitter and soothing, and are used to treat burning sensations in the body, hunger, strangury, masses, and leprosy. In cases of high-grade fever, the big leaves are used as cool bed sheets: <sup>[29]</sup>

**Flower Part:** it is sweet and cooling; it relieves cough, thirst, blood disorders, skin eruptions, and poisoning symptoms; it is ideal for fever and biliousness; it is good for the eyes; and it is often prescribed as a heart tonic.

**Fruit Part** is bitter and astringent, soft and cooling; it relieves thirst, blood impurities, Kapha and Pitta imbalances, and foul breath: <sup>[30]</sup>

**Seeds Part:** sweet and flavorful, astringent and mildly bitter, aphrodisiac, sedative to the pregnant uterus, kill Kapha and Vata, strong astringent in diarrhoea and dysentery, improve the body, useful in body fire, dehydration, and leprosy.

**Medicinal Therapeutic Uses**

- An aqueous extract of the fresh rootstock of the white flowered variety is given internally for snake bite and is believed to be especially useful in the bites of the cobra.
- The seed powder of *Kamal* is used with honey, honey is an excellent tonic, removes *Tridosha* and useful in diseases of the eye.
- The plant in combination with other drugs is considered an antidote to snake venom (Charaka, Sushruta, Vagbhata, Sharangdhar *Samhita*) and in scorpion venom (Charaka, Sushruta, Rasaratnakara, Vaidyavinoda).<sup>[31]</sup>
- The root is diuretic and useful for strep throat, chest pain, spermatorrhea, leucoderma, and small pox. (Yunani). The *Kamal* seeds are cooling, diuretic, and uterine tonics, and are beneficial in menorrhagia and leucorrhoea. They are also helpful in fevers and chest problems. <sup>[32]</sup>
- In *Krmidanta*, the root of the lotus may be chewed. <sup>[33]</sup>
- In *Balatisara*, lotus stamens are pounded with rice water and served with sugar – candy juice.

- In high-grade fever, a cold infusion (Phanta) with sugar is used to strengthen the muscle.
- It acts as a strong heart tonic when combined with Shweta-rakta chandan, Balak, Mulethi, and Mustak. <sup>[34]</sup>

**Pharmacological Action of Drug on Body**

Antidiabetic, antipyretic, anti-inflammatory, anticancerous, antimicrobial, antiviral, and anti-obesity effects are all present in the genus *Nelumbo* <sup>[35]</sup>. In addition, *N.nucifera* flowers are used to treat asthma, cancer, diarrhoea, fever, fatigue, infection, and body heat deficiency as safer beverages <sup>[36]</sup>. It's been used for a long time in folk medicine to cure inflammatory and infectious diseases <sup>[37]</sup>.

**Antidiabetic properties**

Standard rodents, glucose-fed hyperglycemic rodents, and streptozotocin-induced diabetic rodents all had their blood sugar levels lowered by an ethanol rhizome extract.<sup>[38]</sup>

**Anti-inflammation Action**

The anti-inflammatory properties is similar to those of phenylbutazone and dexamethasone.<sup>[39]</sup>

**Antipyretics Action**

The antipyretic ability of an ethanol extract of *Nucifera* stalks was tested in rodents with normal body temperature. At oral doses of 200 and 400 mg/kg, the stalk extract showed substantial activity. At 200 mg/kg, the stalk extract caused substantial lowering of natural body temperature for up to 3 hours, and at 400 mg/kg, it caused significant lowering of body temperature for up to 6 hours after administration.

**Nootropics Action**

The head dip and Y maze experiments revealed that methanolic extract of *N.nucifera* rhizomes caused substantial reductions in random function, decreased exploratory behavioural pattern, muscle relaxant function, and potentiated pentobarbitone mediated sleeping time:<sup>[40]</sup>

**Obesity and Phospholipid effects**

In rats fed a high-fat diet, a Chinese herbal mixture containing holy lotus reduced serum triglycerides and cholesterol. In rodents, lipolysis was triggered by ethanol leaf extracts in visceral and subcutaneous adipose tissues. <sup>[41]</sup> The beta-adrenergic receptor was shown to be active in energy consumption and the prevention of diet-induced obesity. In mice fed a high-fat diet, the ethanol leaf extract also reduced body weight gain.

**Antiplatelet Action**

The hydroethanolic extracts of white and pink *Nucifera* flowers have potent antiplatelet activity in human blood that is limited to primary haemostasis. Apart from the release of cytoplasmic calcium, which activates the release of ADP, the flavonoids contained in hydroethanolic extract may have stopped platelet adhesion and aggregation. <sup>[42]</sup>

**Antianalgesic Action**

A powerful analgesic agent is a methanolic extract of red and white lotus seeds. When comparing the effects of the different lotus seed extracts, the white lotus seed extract at 600 mg/kg body weight had the greatest effect.

**Immunomodulation Action**

In human peripheral blood mononuclear cells, a lotus seed ethanol extract blocked cell cycle initiation, cytokine gene expression, and cell proliferation (PBMCs).

**Hepatoprotective Action**

Hepatoprotective properties of ethanol seed extracts against serum enzyme development and cytotoxicity caused by carbon tetrachloride were found. Aflatoxin B1's genotoxic and cytotoxic effects were also preserved by the extract.

**Anti-infective Action**

By inhibiting HSV1 gene expression, ethanol seed extracts inhibited the multiplication of herpes simplex virus type 1 (HSV-1) in HeLa cells without causing cytotoxicity.<sup>[43]</sup>

**Anti-HIV Action**

Anti-HIV activity was found in alkaloids and flavonoids in a 95% ethanol leaf extract. In this case, various leaf constituents were shown to have antifungal and antimalarial activity against *Candida albicans* and no cytotoxicity was detected.<sup>[44]</sup>

**Ant inflammation Action**

Driven inflammation in rats was blocked by a methanol rhizome extract at doses of 200 and 400 mg/kg. Phenylbutazone and dexamethasone have similar anti-inflammatory activity.<sup>[45]</sup>

**Conclusion**

Herbs of medicinal benefit or properties are used exclusively in Ayurvedic medicine. Ayurvedic plants with medicinal properties are an effective way to cure a wide range of illnesses. *Kamal* has a wide range of medicinal properties, and various parts of the plant are used to treat a variety of ailments. This analysis highlights the significance of *Kamal* (*Nelumbo nucifera*), which has been used in Ayurvedic medicine for the treatment of a variety of diseases since ancient times and has properties such as antidiabetic, antipyretic, anti-inflammatory, anti-cancer, anti-microbial, anti-viral, and anti-obesity. It treats vitiated Kapha-Pitta dosha as well as urinary discoloration. Worms are removed from the whole plant, which often relieves thirst, fever, vomiting, and stangury. The bitter root is used to treat ringworm and other cutaneous diseases with its paste. Stem is used to treat blood problems. This will also include useful details that will aid in gaining a deeper understanding of *Nala* and its various applications.

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**Conflict of interest**

None Declared

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