

# A BRIEF REVIEW ON ETHNOBOTANICAL AND THERAPEUTICAL USES OF *Nelumbo nucifera*

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**Abstract:** *Nelumbo nucifera* is a perennial aquatic plant belonging to family *Nelumbonaceae*, also known by various common names such as Indian lotus, bean of India, sacred lotus or only lotus. This plant grows in lakes of Kashmir naturally and in many Kashmiri cuisines its stem is being used extensively. This plant has been a part of Indian cultural traditions and is one of the most important medicinal plants. Lotus is also used for its religious activities and various parts of the plant have brilliant food values. Lotus has been used as a medicinal herb in China and India. All the different plant parts like leaves, seeds, flower, and rhizome have been used in traditional medicines for curing several medicines since ages. *N.nucifera* has also been used in various kinds of medicine including folk medicines, Chinese medicine, Ayurvedic medicine, and oriental medicines. In medicine's traditional system, the plant has been used for treating smallpox, cough, fever, cholera, hepatopathy, diarrhea, cancer, tissue inflammation, insomnia and to overcome various nervous disorders. The current review addresses the importance of *N.nucifera* in traditional medicines, its ethnobotanical, therapeutic activities.

**Keywords:** Ethnobotanical, Lotus, *Nelumbo*, Therapeutic.

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## 1. INTRODUCTION

*Nelumbo nucifera* with (2n=16) is generally known by names such as lotus or sacred lotus. It belongs to family *Nelumbonaceae* and is an aquatic perennial herb. [1, 2] It has various synonyms like *Nelumbium*, *nelumbo*, *N. speciosa*, *N.speciosum*, *Nymphaeanelumbo*. [3] Lotus is considered sacred and is treated as the sign of purity and sanctity due to the uniqueness of the beauty of the flower. [2] The plant grows to a height of 1.5 meters and spreads horizontally to 3 meters. The leaves are aerial and floating, 60cm large in diameter and float atop the surface of the water. Flowers may be 20cm in the diameter and are formed on the stem which rises above the leaves. Lotus plant is cultivated by using rhizomes and its seeds. The diameter of the seeds is 1cm. [4]

The fruit is a mass of indehiscent nut-lets. Ripened nutlets are roundish and ovoid in shape and 1.5 wide with brownish or black pericarp and are one seeded. [5]

Two varieties of 'Kamala' are there; i.e, one is called as 'Pundarika' or 'Sveta Kamala' which has white flowers. The second one is 'Rakta Kamala' which has pink or reddish coloured flowers. [6] The overall plant having flowers is called as 'Padmini', the rhizomes are known as 'Kamalkand', 'Sambartika' for tender leaves, 'Padmakosa' for peduncle, seeds are 'Karnika' and the torus is called as 'Makaranda'. [7] Different areas in the world have its own history regarding the traditional medicine, e.g. Southeast Asia is the place of origin for Ayurvedic medicine, and the technique of acupuncture along with the folk Chinese medicine was originated in China. [08-10]

Its stalks, buds, roots, stamens, and other parts are used for treating many diseases like heart problems and depression, etc. [11, 3] Lotus leaves are used in rural Bengal in large gatherings of religious ceremonies in the form of plates. Ponds with lotuses grown in them are considered as sacred and therefore most of the shrine ponds have lotuses. It is also a symbol of aesthetic beauty. [12]

**1.1 Synonyms: [13]**

English – Sacred lotus;

Hindi – Kanwal, Kamal;

Sanskrit – Ambuja;

Tamil - Ambal, Thamarai, Padma, Pankaja, Kamala;

Bengal – Padma;

Gujarat –Suriyakamal;

Malayalam – Tamara;

French –Nelumbo;

German – Indischelotosblume;

Persian – Nilufer.

**1.2 Nutritional Composition:****Roots or Rhizome**

Several forms and products of the rhizome of the lotus are used in drinks, fresh, in teas, salted, etc. [14, 15] Lotus rhizome comprises of 9.7% carbohydrates, 1.7% protein, 1.1% ash, and 0.1% fat. [16] It is used in Chinese cooking and tastes like beet and also exhibits moderate flavor. [17, 18] Petals are sometimes used for garnishing and stamens in the form of flavoring agent in teas, etc. [19]

**Table 1: Nutritional value per 100g , Lotus root (Cooked, no salt) [20-]**

Constituent	Quantity	Constituent	Quantity	Constituent	Quantity
Energy	278kJ(66kcal)	Thiamine (B1)	0.127mg	Calcium	26mg
Carbohydrates	16.02g	Riboflavin (B2)	0.01mg	Iron	0.9mg
Sugars	0.5.2g	Niacin (B3)	0.3mg	Magnesium	22mg
Dietary fiber	3.1 g	Pantothenic acid(B5)	0.302mg	Manganese	0.22mg
Fat	0.07g	Vitamin B6	0.218mg	Phosphorous	78mg
Protein	1.58g	Folate (B9)	8 mg	Potassium	363mg
Water	81.42g	Choline	25.4 mg	Sodium	45mg
-	-	Vitamin C	27.4mg	Zinc	0.33mg

**Seeds**

Seeds of lotus have high nutritional content. Different cultures use different varieties and yield distinct contents of every nutrient. [21] Lotus seeds are rich in fats, proteins and carbohydrates and not only this but also contain a large number of trace elements such as calcium, iron, phosphorous, vitamin Ve, Vb, Vc . [22] Lotus seeds are extensively consumed as raw or in a roasted form and also used in pastries and desserts. [23] Lotus seed skin is also used extensively due to its nutritional content. [24] *N.nucifera* seeds contain 348.45cal/100g and 10.5% moisture. [14, 25]

**Table 2 – Nutrients present in Lotus seeds: [26] [27]**

CALORIES	DAILY LIFE (%)
Total fat 2 g	3
Saturated fat 0.3 g	1
Cholesterol 0 mg	0
Sodium 5 gms	0

Potassium 1,368 mg	39
Total Carbohydrate 64 g	21
Protein 15 g	30
Vitamin A	1
Vitamin C	0
Vitamin b-6	30
Vitamin b-12	0
Calcium	16
Iron	19
Magnesium	52
Ph range	7 to 8.5
Soil range	Undefined
Energy	278 kJ (66 kcal)
Sugars	0.5 g
Total phenolic content	7.61 ± 0.04% (w/W)
Ash (%)	4.50
Moisture Content (%)	10.50
Crude Fat (%)	1.93
Protein (%)	10.60
Carbohydrate (%)	72.17
Crude Fibre (%)	2.70
Energy (cal/100 gm)	348.45

## 2. USES

### 2.1 Therapeutic/Traditional Uses:

1. People used lotus in traditional medicines due to its outstanding health benefits all over the world. Since ancient times, plants have been used by mankind as a source of medicine. In Ayurveda, Unani, Siddha, and some other systems in India, many traditional people and communities' indigenous knowledge has been documented and formulated. Lotus plant is used as an anthelmintic and as a diuretic in Ayurveda. It's been used for the treatment of leprosy, nervous exhaustion, strangury, vomiting, and skin diseases. [3, 28, 29]

2. Lotus is proved to be an important traditional herb in China. Its seeds are edible and with being medicinally versatile, it is used in the Ayurvedic and Folk medicines as an important raw material for old age traditional medicinal preparations. It is useful in bread preparation. In folk medicines, being used as raw material, it is helpful in treating several ailments like cancer, poison antidote, tissue inflammation, and diuretics. [29] Its seeds are also used for the treatment of halitosis, fever, dermatography. [30]

3. Many investigations by the scientists have demonstrated the traditional knowledge of medicinal properties of lotus. *N.nucifera* was used as emollient, cardiotoxic, antipyretic, sudoforic and antifungal in ancient times. Various parts of the lotus plant are generally used in inflammatory and hemostasis treatment. [31]

4. Lotus is used for the treatment of sunstroke, dizziness, dysentery, uterine bleeding problems, improving the skin conditions, vomiting of blood, against infections promoting conception, cough, controlling the burning sensation, urinary problems, epistaxis, hypertension, hematuria, hematemesis, hemoptysis, metrorrhagia, fever etc. [32, 33]

5. In folk medicines, therapeutically flowers are used as a cardiac tonic and seeds are used for an antidote, and usually prescribed as a refrigerant to children. [34] Seed's powder when mixed with honey is generally used for cough treatment and roots when mixed with ghee, gold, and milk increase virility, intellect and strength. [35, 36] 'Lian Zi Xin', a traditional Chinese drug, is made from Embryo of lotus seeds. This drug helps to cure insomnia, cardiovascular diseases, high fevers, and nervous disorders. [37]

6. *N.nucifera* rhizomes are used for leucoderma, spermatorrhoea, pectoralgia, and pharyngopathy traditionally. The stem is used to treat anthelmintic and nervous exhaustion, vomiting and strangury. Young lotus leaves mixed with sugar are used for Rectal Prolapse Therapy process. *Mimosa pudica* and leaves boiled in goat's milk are used to treat diarrhea. The paste of lotus leaves is made and its remedies are used as an anti-inflammatory. [33] An experiment was done and it reported that in rodents, lotus leaves treated hyperlipidemia. [38, 39]

7. Leaves and flowers are helpful in the treatment of bleeding disorders. Cholera can be treated by consuming flowers. [34] Rhizomes are beneficial in Chronic dyspepsia and are advised as demulcents for hemorrhoids and have Cholagogue and nutritive activities. [40, 41] *N.nucifera* stem is been used in Ayurvedic medicinal purposes as anthelmintic, nervous exhaustion and for treating strangury. [38]

8. In "Compendium of Materia Medica", it was also recorded as a thirst quencher, calming the nerves, reducing anger, as a sedative and including other effects. [42] Lotus seeds were used traditionally in the diet and hepatoprotective ingredients. [43] In "Shen Nong's Herbal Classic", as early as the Han Dynasty in China, seeds of lotus were already documented as flat, sweet, nourishing the kidney and heart and astringent. [44]

## 2.2 Ethnobotanical Uses:

1. In China, lotus seeds have been traditionally marked as a symbol of fertility. When newly wed couples are having their babies and if they expect to give birth to a baby boy, then they consume foods in which lotus seeds are used as an ingredient. [45] Seeds are also sold in Asian markets in packages.

2. They are mainly consumed in Japan, China, India, Southeast Asian countries, Oceania and America. [8]

3. 'Chinese Ministry of Health' approved the use of lotus seeds as both medicine and food. Research showed that they play a significant part in human health and is rich in bioactive substances and nutrients. [46]

4. In China and India, lotus seeds are used in the form of lotus seed noodles, moon cake, for breakfast like in the form of fermented milk, ice cream, rice wine, paste and as a raw material in drinks and foods. [12]

5. The plant has been honored by India, Egypt, and China for its beauty, purity, and perfection. Lotus seeds are popular in Korea and Australia Pacific also. [15]

6. From Kashmir to Kanyakumari, in the south, in India, lotus seeds show high diversity in phenotype having different sizes, several shapes, shades of purple, pink, and flowers of white colour having up to 6-160 petals. [47] It is the National flower of India. American lotus or *Nelumbo lutea* is distributed in south and North America. [48].

## 3. CONCLUSION

Ethno medical information has helped humans to tackle many diseases. Different parts of the lotus are used for food and traditional medicine practices. Fortunately, in India, the lotus grows in vast wetlands of different kinds like ponds, ditches, fallow wetlands (like beel, jheel) channels, lakes, canals, and reservoirs. Seeds of the lotus are consumed and other parts of the plant are used in cookery and dishes since ages. Lotus is also used as a folk medicine so as in the treatment of various ailments like skin diseases, tissue inflammation, etc. Its seeds are rich in fatty acids, proteins, and minerals. It was also used in traditional system of medicines to treat cardiovascular diseases, diabetes, and bleeding disorders. The plant will be of economic value if it can be developed as a functional food. Therefore plant has amazing ethnobotanical and therapeutic uses. Along with this, the plant has high nutritional content and can be used for food purposes all over the world. So the need of the hour is to further evaluate the medical and nutritional importance of the lotus plant. People should conserve the plant and its habitat to keep it available both medicinally and nutritionally for coming generations.

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