

## Ethnobotanical Study of Makhana in Mithila (Koshi Region) of Bihar

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### **Abstract: -**

Makhana is an aquatic plant and the seeds germinate when they are placed inside the water. The seeds are round in shape and their colour varies from brown to black. Their size ranges from 5 to 15 mm in diameter. Mithilanchal has always been known for its Makhana. It is one of the most promising income generators for the local populace of the Koshi Region. In other states of India, *Euryale ferox* seeds are not eaten raw but they are popped in North Bihar to make Makhana. Makhana is highly priced and is exported in significant quantities outside the country after processing.

The Koshi Region is replete with traditional knowledge about cultivation, harvesting and uses of Makhana among its people. The major drawback with Makhana cultivation is that the interfacing ribs of leaves and petioles are prickly. The mature fruits are borne on long pedicels and are difficult to harvest due to the stout prickles on the outer surface.

Makhana has widely been used in traditional and oriental medicines to cure a variety of diseases, like kidney problems, chronic diarrhoea, excessive leucorrhoea and hypofunction of the skin. Based on the recent studies revealing its antioxidant activities and its glucosides composition, it is found that Makhana seeds can reduce myocardial ischemic reperfusion injury.

Therefore, Makhana bears great economic and medicinal potential for the people of Koshi Region and this needs to be utilised efficiently

**Keywords:** Makhana, Mithila, *Euryale ferox*, Koshi Region, myocardial ischemic reperfusion injury, diarrhoea and excessive leucorrhoea

### **Introduction**

Makhana (*Euryale ferox*) is famous all over the world but is always associated with eastern India. My research is based on Mithila region of Bihar which has its roots dating back to the Treta Yuga (Ramayana Era). The term Makhana and Mithila have always been used together since times unknown. Makhana has a great significance in the lives of the Maithil people (people of Mithila) and they have been cultivating Makhana from a long time. It is a cash crop and serves as the income of many farmers in this region.

(Source : Wikimedia commons)



It is cultivated in stagnant water present in ponds, lakes and other such water bodies. It is a 6-8 months crop. When the seeds left over at the pond's bottom germinate as crops for the next season. The crop achieves maturity and senescence by July - August. In new ponds (or when the plants are damaged by pest in early stages in the old pond), young plants are transplanted latest by early April. It would not be out of context that Makhana in Koshi region, is a forced annual plant. This is because the pond's bottom has to be virtually swept for the collection of seeds. The plants are either naturally uprooted by high floods in the months of July and August or they are destroyed by farmers. Makhana ponds do possess an indigenous fertility status and nothing except the seeds are taken out of the system. The organic matter remaining at the bottom of the pond mineralises during the next summer and is made available to the succeeding crop as good manure during its grand growth period.



Makhana in Pond (Clicked during field work)

Major crop investments are labour, required for transplantation harvest and copying operations. Costs are also incurred on weeding out the floating and submerged macrophytes and on insecticides. Makhana is generally consumed in popped form as snacks or as pious and offerings to the god. It is also used in preparing curries and dals. Makhana is very rich in proteins content and is known for high essential amino acid index (EAAI) of about 90%. This makes it comparable to fish and mutton so far as the quality of proteins present is concerned. Raw seeds powder is an essential ingredient of baby food which has a strong system of indigenous medicine. It has about 76% carbohydrates, 10% proteins, 14% fibre and 0.1% fats.

Makhana is widely used in traditional oriental medicines to treat a variety of illness, like kidney problems, chronic diarrhoea, excessive leucorrhoea and hypo function of the skin. Based on the recent studies revealing its anti-oxidant activities and its glucosides composition, it is found that Makhana seeds can reduce myocardial ischemic reperfusion injury.

## Methodology

Ethnobotanical information was collected from the people of Mithilanchal. A survey was conducted in five villages of Mithila (Koshi Region) such as Kunauli, Navtol, Dyodh, Fulparash and Jagatpur. People of different age group were selected as informants. They were asked the following questions:

1. What are the uses of Makhana?
2. Does Makhana have medicinal value?
3. Is it also used as a cash crop?
4. Are there any side effects of Makhana?
5. What is the season of cultivation and harvesting?
6. What problems are faced in cultivation?

## Result

### Nutritional value of Makhana

Makhana is very nutritious diet for all age groups. It contains only 0.1% fats, 9.7% proteins, 76.9% carbohydrates and 14.5% fibers. Seeds of *Euryale ferox* contain saturated fat and good sources of magnesium, protein and phosphorus. Seeds are low in cholesterol and their extremely high nutrient content makes them an extremely healthy snacks. Their protein content makes them extremely useful in one's weight loss goals. In addition to that they are also low in calories.

Nutritional value of Makhana in 100g :

<i>Quantity</i>	<i>100 g</i>
Calories	347 cal
Protein	9.7 g
Fats	0.1. g
Carbohydrates	76.9 g
Fibres	14.5 g

Makhana used in Religious Worshipping and Rituals People of Koshi region mainly used Makhana in worship, they offered garland made of Makhana pops to deities and distinguished guests. Local people used it in fasting either roasted or in the cooked form as kheer (pudding). In marriage ceremony Makhana used as symbol of Shagun (good luck). Even after death, they used to put makhana inside the mouth of corpse.

There is a saying prevalent among the people of the Koshi Region that in times of scarcity, religious worshipping or even hosting of guests can be done with just Makhana (*Euryale ferox*) and Paan (Betel leaf).

## **Benefits of Makhana**

Being low in calories, makhanas promote weight loss, while their calcium content makes them extremely good for the bones. These seeds also contribute greatly to the controlling of blood pressure, detoxification of the body, and improved digestive health. Their anti-ageing properties also help slow down the ageing process of the body.

The regular consumption of Makhana help fight free radicals. Thus, they act as an anti-ageing agent. Makhanas contain a natural flavonoid called kaempferol that helps slow down the ageing process. This flavonoid helps keep away signs of ageing such as hair loss, greying of hair, and the formation of wrinkles.

## **Side Effects and Precautions of Makhana**

While makhanas have several health benefits and incredible nutritional value, there are certain precautions that must be taken while consuming them. One must take special care to take these precautions and avoid the side effects of Makhana.. If you feel any allergy symptoms upon consuming makhanas, it is best to consult a physician with regard to the same. Consuming Makhana in excess can lead to constipation, flatulence, and bloating. An individual that is already suffering from constipation must avoid makhanas completely.

## **Conclusion:-**

Makhana (*Euryale ferox*) is used in a number of ways by the ethnic populace of the Koshi Region and Mithila. From supplying significant nutritional value and health benefits to the diet of these people to occupying an important place in their traditions and customs, Makhana's significance for the people of this region is immense. In spite of immense value that the crop poses and its ease of cultivation in this region, people have failed to fully utilise the economic potential of this crop.

Floods pose a challenge in these regions, especially the river Koshi is notorious for flooding almost every year. To fully utilise the economic potential, new methods to counter low yield or destruction of crops during floods should be developed.

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