

## **Lotus Fiber: A new facet in textile and fashion**

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Date of Submission: 01-12-2018

Date of acceptance: 17-12-2018

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### **I. Introduction**

“Ecofriendly” is the new and emerging term in today’s life. Many new fibers are introduced in order to have a sustainable and environment friendly future for next generation. Working in the same direction one such upcoming fiber is the lotus fiber. The binomial name of lotus is *Nelumbo nucifera*. It is also known as sacred lotus, bean of India, Egyptian bean or simply lotus. This plant is an aquatic perennial. It has been distributed very widely all over India, ranging from central and northern India (at altitudes up to 1,400 m or 4,600 ft. in the southern Himalayas). It has a very long history (c. 3,000 years) of being cultivated for its edible seeds, and it is commonly cultivated in water gardens. It is the national flower of India and Vietnam. It is a symbol of divine purity and immortality in many Asian cultures, appearing in the hand of sacred Buddha. It has medical and cultural uses. The roots of lotus are planted in the soil of the pond or river bottom, while the leaves float on top of the water surface or are held well above it. The flowers are usually found on thick stems rising several centimeters above the leaves. The plant normally grows up to a height of about 150 cm and a horizontal spread of up to 3 meters. The leaves may be as large as 60 cm in diameter, while the showy flowers can be up to 20 cm in diameter.

#### **History of the lotus fiber:**

Lotus fiber is extracted from lotus stems since 1910. Later during the 90’s, Japan set up workshops to create a foreign market for their handmade textile and that fabric remained exceptional. Lotus plant is also having healing abilities and wearing a fabric made from lotus fiber is also believed to have the same effects. Lotus plants are pure by virtue and they emit this purity through their fibers. By wearing lotus fiber fabrics, wearer feels calm, peaceful and meditative. It also cures the wearer from headaches, heart ailments Asthma, and lung issues. The fabric made from lotus fiber is 100 percent organic and hence are environmental friendly.

#### **Need of the study:**

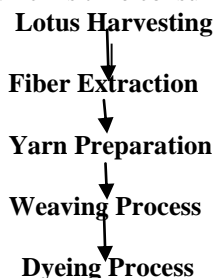
- To make everyone aware about the lotus fiber, this is the new upcoming fiber in the world of textiles and fashion.
- Fiber can be utilized for varied purpose depending upon its inherent properties.

#### **Objectives:**

- To study the history, manufacturing process and properties of lotus fiber.
- To document the uses of fiber in textile and non-textile field.
- To assess the availability of lotus fiber.

#### **Manufacturing Process:**

The entire manufacturing process is handmade. The process begins with fiber extraction, spinning it into yarn and making the fabric which is time consuming. This also limits the quantity of the fabric produced.



**Lotus harvesting:**



**Plate No. : 1**

The Lotus harvesting is mainly from lotus flowers; occur in the giant lake of Kamping Poy near Battambang, Cambodia. The pink and white flowers of the aquatic perennial spread through thousands of bodies of water in Cambodia, and are harvested during the rainy season from June to November.

From several generations, Lotus flowers have been farmed on this lake and used for the extraction and sale of the seeds or seed heads of the flower. The area surrounding the lake is the only one place in the world which currently host to lotus fabric weaving. The lotus fabric weaving was brought to village of Kyaing-kan in 2009 by Awen Delavel, a French designer and founder of eco-fashion label Samatoa. He has been working with local women in order to inculcate skills of weaving amongst them and to create a local economy that they can rely and make wages on.

**Lotus fiber extraction:**

The stems of the lotus flowers are gathered by younger women in the mornings. These stems are cut with shallow knife and 5-6 stems are snapped at one time, which reveals 20-30 fine white filaments of fiber. These filaments are drawn out of the stem, hung to dry and then rolled into single thread of 100-yards in length.



**Plate No.2**

It is very painstaking and time-consuming process. To keep one weaver busy; around 25 thread makers are required.

**Yarn preparation:**

Fibres extracted from the stem are spun into yarn. Extracted fibres are placed in the skeins on a bamboo spinning frame to prepare yarns and transferring the thread into winders for warping. Threads are made; up to 40 meters long to avoid entanglement. The threads are then taken from the warping posts, and are coiled into huge plastic bags. Yarns for the weft are wound into bamboo bobbins.



**Plate No.3**

**Weaving process:**

Fabrics are woven in the traditional Cambodian loom. The woven fabric has a width of approximately 24 inches. During the process of weaving, threads are frequently moistened with water, as lotus fibres need to be kept cool.

The fabric is woven in 100-yard batches, and it takes about a month and a half to complete one batch. It's estimated that around 32,000 lotus stems are required to make just 1.09 yards of fabric and 120,000 stems are required for one outfit, making the textile extremely exclusive. After weaving, the fabric is dyed with natural dyes and every part of the precious material is utilized in some way. Leftover scraps of yarn are twisted into the wicks of pagoda lamps, and leftover pieces of fabric are made into sequin-studded robes for mini-Buddha statues.



**Plate No.4**

**Dyeing process:**

Only Natural dyes are used on lotus fiber. Natural dyes are made from the bark of a tree, flower petals, leaves, and fruits. Yarns are dyed in skein forms in different dye baths. After dyeing, fabric and skeins are dried outside in sunlight.



**Plate No. 5**

### **Properties of Lotus fiber:**

- It is a cellulosic fiber and finest aquatic fiber. (Waterproof fiber)
- It is cool, stiff, breathable and comfortable fiber.
- It has good elasticity.
- It is Crease resistant fiber.
- It absorbs moisture but dries fast.
- Fabric produced with this fiber has outstanding properties.
- It doesn't contain any chemical or toxic products so it produces ecological fabric.
- The manufacturing process doesn't require any gas, petrol, electricity or additional water.
- The lotus flower is a phyto sanitary plant that cleans the water in which it grows and preserves the ecosystem while protecting fish and insects.
- The whole process takes place within the framework of sustainable development.

### **Lotus fabric:**

The **Lotus fabric** is the **first natural microfiber** and probably the **most ecological fabric** in the world. Like other microfibers, it has remarkable properties: it is amazingly resistant, soft, light-weight, wrinkle-free and sustainable. The plain woven pure Lotus fabric is recommended for jackets, one piece and dresses, as it is hard wearing and soft. The airy pure Lotus fabric is recommended for scarves, as it is especially breathable and light.

Samatoa is recognized as an eco-friendly textile mill and design house, as it is providing Cambodian women with highly regarded textile crafting skills. Founder Awen Delavel has also set up The Lotus Center in Battambang, which provides a venue for the experimentation of research on lotus fibers and sub products. Although garments made from lotus fabric are not readily available on the current market, Italian company Loro Piana does plan to sell currently sold through Samatoa's website. Lotus flower fabric is available in light red, green, yellow, chocolate, orange colors. Accessories such as light scarves and blazers made from the lotus fabric are sold at around \$6,000 a piece.

### **Uses of Lotus Fiber:**

It is powerful plant as it has many healing properties, so it offers many health benefits. Different parts of this beautiful plant can be used for health and nutrition.

### **Medicinal Uses of the Lotus Plant:**

- For centuries, lotus flowers, seed, leaves, and parts of the underground stem (rhizome) have been used to make medicine.
- Lotus flowers are used to stop bleeding.
- Lotus seeds are used for disorders of the digestive tract, including diarrhea. Lotus flowers have been used in Ayurvedic medicine to treat diarrhea.
- The seeds are used to treat inflammation and skin problems, including acne. When combined with green tea, an emulsion of lotus flower applied to the skin significantly reduced acne.
- In traditional Chinese medicine, the embryo of lotus seeds are known as Lian Zi Xin. They are used to treat nervous disorders, insomnia, and cardiovascular diseases (hypertension and arrhythmia).
- Mixed with honey, a powder of lotus seeds is useful in treating cough.

### **Lotus Roots Nutrition Facts Profile:**

- Moderate in calories, provides 74 cal per 100g.
- Good levels of dietary fiber, about 13% of daily requirement.
- Low in fat and no cholesterol.
- Excellent source of Vitamin C, with 73% of RDA per 100g.
- Provides a number of B-complex vitamins and several minerals, along with good amounts of copper and iron.
- Low in sodium and high in potassium and has the optimum 1:4 ratio of these minerals.

**Disadvantages of lotus fiber:**

- Raw material collection to yarn spinning and weaving is completely handmade so the process is time consuming and expensive.
- The lotus fabric must be woven within 24hours to prevent the deterioration of fiber.

**Conclusion:**

- Being an upcoming fiber it can be used in making union fabrics with any natural fiber available.
- Functional clothing can be prepared by using lotus fiber in required percentage.
- Different types of weaves can be tried by utilizing lotus fiber (other than plain weave only)
- Also various surface ornamentation techniques can be used on lotus fabrics and its blends and union fabrics.
- Lotus fiber can be used in ayurvastra manufacturing too.

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