

## SUSTAINABLE DEVELOPMENT OF ORGANIC SANITARY NAPKINS USING BAMBOO FIBER

Mounika K.<sup>1\*</sup>, Dr. K. B. Ilango<sup>1</sup>, Baranitharan A. K.<sup>2</sup>, Dhivyatharshini S.<sup>3</sup>,  
Gowtham K.<sup>4</sup>, Swetha V.<sup>5</sup> and Vijaykumar S.<sup>6</sup>

<sup>1\*</sup> Associate Professor, Department of Pharmaceutical Chemistry, College of Pharmacy, Shree Venkateshwara College of Paramedical Sciences, Gobi. Tamilnadu-638455.

<sup>1</sup> Principal, Head of The Department of Pharmaceutics, College of Pharmacy, Shree Venkateshwara College of Paramedical Sciences, Gobi-Tamilnadu-638455.

<sup>2,3,4,5,6</sup> B.Pharm Final Year Students, College of Pharmacy, Shree Venkateshwara College of Paramedical Sciences, Gobi-Tamilnadu-638455.

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### \*Corresponding Author

**Mounika K.**

Associate Professor,  
Department of  
Pharmaceutical Chemistry,  
College of Pharmacy, Shree  
Venkateshwara College of  
Paramedical Sciences, Gobi.  
Tamilnadu-638455.

### ABSTRACT

Menstrual hygiene is an issue that every girl and women had to deal with in her life, but nowadays there is a lack of awareness about the physical and psychological changes associated with puberty and menstruation process for managing and regulating menstruation. The commercially available menstrual hygiene pads are mainly laced with dioxins, petrochemicals and artificial fragrances and when these chemicals react with the sensitized skin tissue, it can cause skin irritation. The ingredients present in the synthetic pads are problematic for female reproductive system as it is very sensitive and absorptive. In order to overcome and reduce these severities, we can use natural materials like banana fiber, bamboo fibers, papyrus, cotton, water hyacinth, aloe vera, hemp with antimicrobial activity for preparing sustainable sanitary pads. The presence of bamboo in sanitary napkins

so that it is an excellent absorbent material compared to cotton and also can reduce the complications of women during menstruation. Bamboo fibers are used in sanitary napkins for its Anti-fungal properties.

**KEYWORDS:** Napkins, Menstruation, bamboo, Sensitive, Reproductive, Antimicrobial, Absorbent, Papyrus, Aloe vera, Hygiene.

## INTRODUCTION

In our daily life, everybody is concerned with creating the ecofriendly environment thereby decreasing the environmental problems and natural pollution. Menstrual hygiene is an issue that every girl and women had to deal with in her life, but nowadays there is a lack of awareness about the physical and psychological changes associated with puberty and menstruation process for managing and regulating menstruation. Many women feel some pain and displeasure during menstruation, so it will impact on their daily activities. The process of discharge of blood and other waste materials from the lining of the uterus of women in an interval of about 28 to 35 days from the puberty until menopause is known as Menstruation. Nowadays, the menstrual hygiene pads available are laced with dioxins, petrochemicals and artificial fragrances and when these chemicals react with the sensitized skin tissue, it can cause skin irritation.

In order to overcome and reduce these severities, we can use natural materials like banana fiber, bamboo fibers, papyrus, cotton, water hyacinth, aloe vera, hemp with antibacterial activity for preparing sustainable sanitary pads. The aim of our research is to acknowledge the use of biodegradable sanitary pads to manage menstrual complications and to explore many other natural products using bamboo to reduce the problems in women.

## OBJECTIVES

- ❖ Free from allergies, infections and irritations.
- ❖ To produce 100 % chlorine free and environment friendly biodegradable sanitary pads.
- ❖ To provide pH compatible and plastic free napkins.
- ❖ To reduce the risk of infections in women.

## MATERIALS AND METHODS

### MATERIALS USED

Bamboo fiber is commonly used as an essential raw material for manufacturing biodegradable sanitary napkins. Surface layer of napkins is made of bamboo fiber and its pulp is used as an absorbent material. The sources include fields of villages, post-industrial scrap textiles from other industries and by-product from fabric manufacture.

### ❖ BAMBOO FIBER

Bamboo belongs to a large family called Poaceae. Bamboo fiber is a natural fiber processed either as a naturally occurring best fiber or a regenerated manufactured fiber and starchy pulp

is produced from bamboo stems and leaves by a process of alkaline hydrolysis and multi-phase bleaching. Bamboo fiber contains an excellent Anti-fungal activity. They are used for making sheets, blankets, towels, hand towels or a number of other household textiles and construction, furniture, food, biofuels, fabrics, cloth, paper, pulp, charcoal, etc. Bamboo clothing is luxuriously soft when compared to cotton and silk. It can able to absorb moisture 40 % better than cotton, so it is commonly used in manufacturing biodegradable sanitary pads for managing the menstrual hygiene of women.

### **ADVANTAGES OF BAMBOO FIBERS**

- ✓ Cool and Breathable
- ✓ Resistant to wrinkles
- ✓ Ecofriendly
- ✓ Good Absorbent, soft, smooth and luxurious
- ✓ Durable and Long-lasting
- ✓ Abrasion resistant
- ✓ Hypoallergenic and strong
- ✓ Anti-bacterial and Anti-fungal

### **METHODS**

#### **1. HARVESTING**

Bamboo is harvested, mainly matured bamboo is used. Harvesting bamboo is more sustainable than the traditional tree-based pulp.

#### **2. PULPING**

The bamboo is then processed to extract the cellulose fibers. This can be done through mechanical or chemical pulping methods. Mechanical pulping is more eco-friendly as it doesn't involve harsh chemicals.

#### **3. BLEACHING**

If the bamboo pulp needs to be bleached to achieve a white color, chlorine-free bleaching process is often used to minimize environmental impact.

#### **4. FORMING**

The pulp is mixed with water and then formed into napkin-sized sheets.

## 5. PRESSING AND DRYING

The sheets are then pressed to remove excess water and dried.

## 6. CUTTING AND PACKAGING

Once dried, the sheets are cut into individual napkin sizes and packaged for sale.

Bamboo napkins are mainly known for their sustainability because bamboo is a fast-growing renewable resource. When choosing bamboo napkins, look for products that are labelled as ecofriendly and sustainable to ensure the most environment friendly option.

## PHYTOCHEMICAL ANALYSIS

**Table 2: Phytochemical screening of Bamboo fiber.**

CHEMICAL COMPONENTS	PERCENTAGE
Hemicelluloses	12.49
Cellulose	73.83
Lignin	10.15
Aqueous extract	3.16
Pectin	0.37

## RESULTS AND DISCUSSIONS

Bamboo fiber is more absorbent than cotton. From this experiment, it shows that bamboo fiber in a non-woven wadding form which is more absorbent than cotton, and almost twice as absorbent as other standard sanitary pads. Many recent studies found that, bamboo fiber is used as an absorbent core in a traditional sanitary napkin, as it absorbs and wicks water better than cotton and reduces odor because bamboo fiber is filled with many micro-holes and micro-gaps. The development of bamboo sanitary napkins could be beneficial for many women in managing their complications. In future studies, there will be a chance to discover new biodegradable products using bamboo.

## CONCLUSION

The present study reveals that the bamboo was an excellent absorbent biodegradable material than comparing with water hyacinth, hemp, banana, cotton and papyrus. The presence of bamboo fibers in a biodegradable sanitary napkin promotes better absorption of fluids with good Anti-microbial activity. Future researches will definitely enable the girls to manage menstrual hygiene by making their own natural sanitary pads. Further investigation of researchers using bamboo may have a chance to develop new biodegradable products like sanitary napkins.

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