IDENTIFICATION OF NEW NATURAL FIBRE FROM CHAMAECOSTUS CUSPIDATUS

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Abstract: Fibre identification is a very important element to textile industries, design houses and fashion. The technological changes need to improve the identification methods. In spite of the increase of new technology, the old methods are often the best. The increase in awareness of the damage caused by synthetic materials on the environment led to develop eco-friendly fibres. This paper covers the distinguishing features of natural textile fibre from the plant "Chamaecostus Cuspidatus" that had been extracted using water retting method.

Keywords: natural fibre, Chamaecostus Cuspidatus, eco-friendly.

IDENTIFIKACIJA NOVIH PRIRODNIH VLAKANA OD CHAMAECOSTUS CUSPIDATUS

Apstrakt: Identifikacija vlakana predstavlja veoma bitan element u tekstilnoj industriji, dizajnerskim kućama i modi. Tehnološke promene treba da poboljšaju metode identifikacije. Bez obzira na razvoj nove tehnologije, stare metode su često najbolje. Povećanje svesti o šteti koju sintetički materijali nanose životnoj sredini dovelo je do razvoja ekoloških vlakana. Ovaj rad razmatra karakteristike prirodnih tekstilnih vlakana iz biljke "Chamaecostus Cuspidatus" koja je ekstrahirana metodom potapanja u vodu.

Ključne reči: prirodna vlakna, Chamaecostus Cuspidatus, ekološki.

1. INTRODUCTION

The need of eco-friendly new materials improves the environmental quality of products led to the utilization of raw natural fibres at low cost [1]. Natural fibres are that are produced by plants fabrics are light in weight, soft in texture, and which can be made in various sizes and colors [2]. The Costaceae family native to eastern Brazil is a species of *Chamaecostus cuspidatus* of herbaceous plant. Because of its use in Ayurvedic medicine in India it is known as insulin plant, for its purported anti-diabetic properties [3]. This plant has been proven to possess various pharmacological activities on diuretics, antioxidant, antimicrobial and

anti-cancerous [4]. The objectives of the study are to identify the new natural fiber from *Chamaecostus Cuspidatus* plant (insulin plant) and to extract fiber from the identified plant.

2. METHODOLOGY

2.1. Selection of plant

The *Chamaecostus Cuspidatus* plant was collected from Malppuram district Kerala. It is constituted of stems with a cylindrical spiral shape which have a maximum height of about 1-2 feet. The sample was

Figure 1: Chamaecostu Cuspidatus

washed with water and cut in small pieces, before extraction.

Extraction of fiber by water retting

The main purpose of extraction process is to produce stronger and undamaged fibres, through the elimination of non-cellulosic components such as pectin, lignin and wax. In this study, an eco-friendly technique has been carried out. For more details concerning this extraction process, let us give the main followed steps.

Recipe

Liquor ratio: 250

Period: 35 days

Measurement: 50cm-60cm

Quantity: 20kg

2.2. Procedure

Once the required amount of *Chamaecostu Cuspidatus* is collected, a preliminary process of cleaning with water is conducted, so as to remove the dirt. Also after washing the deteriorated parts of the plant are removed using a knife. After removing all the unnecessary parts of the plant except stem, the stem is cut into approximately 50-60 cm length.

After that, stems were completely immersed in water in a drum which is having capacity of 250 Litre. Then it was covered by a lid for a period of 35 days and kept in room temperature to undergo natural microbial bio-degradation. After the period of

Figure 2: Cultivation of plant

Figure 3: Cut the sample in to 50-60 cm

Figure 4: Sample immersed in water

Figure 5: Sample is beaten by hammer

Figure 8: Dry it on sunlight

Figure 6: Washed in cold water

Figure 9: Combing

Figure 7: Separation of fibre

35 days *Chamaecostu Cuspidatus* stem was beaten using a hammer to separate the cells. Then, the obtained fibres were washed several times in water to remove any remaining unwanted materials from the fibre sur-

face. Finally, fibre bundles were dried in sun light for two days to remove moisture. This is shown in figure 1 to Figure 8.

2.3. Major phases of decotion of plant

Fibre extraction method

Combing

The combing process is carried out in order to improve the sliver coming out of the card. Fibres have a distribution of fibre length ranging from the longest fibre group to the shortest fibre group. For these reasons combing operation is done for fine and strong yarn. Combed sliver has a better lustre compared with cared sliver because of the improved fibre alignment.

Figure 10: Samples

Combing the fibres removes the short fibres and arranges the fibre in a flat bundle. This preparation process is commonly used to spin a worsted yarn.

Procedure

The softened fibres were placed on the combing board flat to its surface. The steel hand comb was passed through the fibres and combed it neatly. By doing this, short fibres were collected on the face side of the comb as shown in Figure 9. It was collected and repeated until good fine getting from the samples.

3. RESULT AND DISCUSSION

The result of this study, "Identification of New Natural Fibres from CHAMAEOSTU CUSPIDATUS PLANT" are discussed under the following headings.

Fiber extraction

Water Retting

Combing

Fiber extraction

Water Retting

In water retting, the most used method bundles of stalks are submerged in water. The water, penetrating to the central stalk portion, swells the inner cells, bursting the outermost layer, increasing absorption of both moisture and decay-producing bacteria.

In here about 250 litres of water is taken in a drum, and 20kg of stem were cut in to pieces immersed into it. It is kept it for 35 day. After 35 days the stems are taken out from the water and beaten with hammer for extracting the fibres separately. The separated fibres kept for one day on sunlight to remove the moisture from it.

Combing

Combing the fibres removes the short fibres and arranges the fibre in a flat bundle, with all the fibres going down the same direction. The softened fibres were placed on the combing board in flat to its surface. The steel hand comb was passed through the fibres and combed it neatly. By doing this short fibres were collected on the face side of the comb.

Fibre is extracted from *Chamaecostu Cuspidatus* plant stem by water retting.

4. CONCLUSION

In this study, the *Chamaecostu Cuspidatus* plant were collected, then the fibres from *Chamaecostu Cuspidatus* stem had been extracted using water retting method. The fibre was extracted from *Chamaecostu Cuspidatus* plant by water retting method and fine fibres were separated by combing process. Thus we can conclude that the extracted fibre can be blended with other fibres for further study.

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