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**Antiodor Evaluation of Microencapsulation and
Nanoencapsulation Finished Fabric**

M. Sumithra

Department of Textiles and Apparel Design, Bharathiar University, Coimbatore, (TN) - India

Abstract

Body odors emanating from a person can be an embarrassing problem in many cultures where natural body odors may be viewed as unpleasant and even considered unhygienic. The present study focuses on the Microencapsulation and Nanoencapsulation of the 100 % cotton denim fabric using herbal extracts of *Senna auriculata* – Leaves followed by pad dry cure method. Theselected fabric were tested for the efficacy of antiodor finish, to enhance the durability of the finished fabrictreated and washed samples are testedusing organoleptic evaluation of odor control and the results showed there was maximum absorbency and retentively of antiodor finish in nanoencapsulated sample when compared to microencapsulated sample.

Key-Words: Fabrics, Microencapsulation, Nanoencapsulation

Introduction

Odor control is a hot topic in the apparel sectors¹. Four factors are required for the complete characterization of an odor: intensity, character, hedonics and detectability. To date, detect ability is the only factor that has been cased in the developments of statutory regulations for nuisance odors². The technology of production of encapsulating materials is rather complex, production of micro and macro capsules involve many general coating devices. Smaller the size, more the production of microencapsules. To carry out micro encapsulation of fabrics it is very easy. The particles could be temporarily or permanently fixed onto the fabrics depending on the end– uses³. The first commercial application of Nano Technology in the textile and clothing industry, is found in the form of nanoparticles through a finishing process, which is generally known as nanofinishing⁴. Jeans are the most prevalent denim garment worn all over the world by rich and poor, Young and old alike. One of the amazing things about denim is that it's been around forever and is still growing in popularity. *Senna auriculata* plant is said to contain a cardiacglucoside,, leaves and bark yield anthraquinones, while the latter contains tannins.⁵ The investigator considered all the above factors and selected the present study to satisfy the consumer by producing Microencapsulation and Nanoencapsulation finish on the 100 % cotton denim fabric.

With this objective, the following study was carried out. To screen for functional properties from the natural herbs for the Antiodorfinish, To finish the herb on the 100% cotton denim fabric and To evaluate the properties before and after wash of the finished fabrics for Microencapsulation and Nanoencapsulation method.

Material and Methods

Selection of material: 100% cotton woven by twill weave -2/1 RHT, weight - 7 ounces, and color - carbon tan were selected for the study. The selected fabric was desized and used for finishing.

Selection of herbs: *Senna auriculata* – Leaves parts were washed twice in freshwater to remove epiphytes and other extraneous matter from the plants.

Methods

Extraction process of herbs: The extraction process was done in three stages, such as drying, grinding and extraction.

Drying of herbs :The collected plants were dried at the room temperature in the open air .It cannot be stored without drying to avoid breakdown of important compounds and also it will be contaminated by microorganisms. The dried herbs were kept in a dark room so that the breakdown of important components by sunlight will be prevented. After drying, those selected portions of the plant to be used and other parts of the plants were separated from dirt and other extraneous matter manually.

Grinding process: Dry Grinding of the selected herbal portion was done in grinder mixers. After that, the powder was sieved with seiver to remove the dirt and

* Corresponding Author

E.mail: mithrasumi6@rediffmail.com

unkind particles. The fine powder obtained was used for extraction.

Extraction-The extraction was done by using methanol.

Microencapsulation and Nanoencapsulation-The Microcapsules and Nanocapsules were applied on the 100% cotton denim fabric by pad dry cure method.

Procedure for Antiodor: The selected male panelists wore the control and finished socks daily during the test period. Each sock was worn on a specific foot. At the end of the stipulated period of time, panelists had to remove the socks in the lab, and seal it in a plastic bag, and collect other socks for the next day. Four judges

were selected to evaluate the odor finish from the worn socks. This evaluation was done after 14 hours of wearing of socks. The rating scale was prepared 0 to 10(10-Ideal, 9-Excellent, 8-Very Good, 7-Good, 6-Fairly Good, 5-Acceptable, 4-Fair, 3-Poorly Fair, 2-Poor, 1- Very Poor and 0 – Repulsive) and was given to the judges for evaluating the effect of odor finish in the socks.

Results and Discussion

The following Table 1 expresses the assessment of antiodor activity exhibited by samples finished with microencapsulation and nanoencapsulation technique.

Table 1: Assessment of antiodor activity for the microencapsulation and nanoencapsulation fabric

S.No	Fabric Samples	Rating scale* Mean
1	Microencapsulated denim sample (MD)	6.2
2	Microencapsulated denim sample after 10 washes (MD10)	5.3
3	Microencapsulated denim sample after 20 washes (MD20)	3.1
4	Microencapsulated denim sample after 30 washes (MD30)	2.1
5	Nanoencapsulated denim sample (ND)	7.1
6	Nanoencapsulated denim sample after 10 washes (ND10)	5.9
7	Nanoencapsulated denim sample after 20 washes (ND20)	3.6
8	Nanoencapsulated denim sample after 30 washes (ND30)	2.8

Rating scale: * 10-Ideal, 9-Excellent, 8-Very good, 7-Good, 6-Fairly good, 5-Acceptable, 4-Fair, 3-Poorly fair, 2-Poor, 1- Very poor and 0 – Repulsive.

Table 1 express that sample Nanoencapsulated denim sample (ND) was rated as good (7.1) with regard to anti odor quality among all eight samples. This anti odor activity was found reduced in sample MD, MD10, MD20, MD30, ND10, ND20 and ND30.

Hence it could be concluded that the anti-odor activity was reduced in the washed samples. This happened because of the reaction of water, detergent and the pressure exerted during washing. Finally it was concluded that fabric finished by Nanoencapsulated method had good retention due to the herbal extracts imparted to the fabric.

Conclusion

After the procedure it was identified by the investigator that the finishing technique by the Nanoencapsulation method in 100 % cotton denim fabric using herbal extracts of *Senna auriculata* – Leaves followed by pad dry cure method possessed 7.1 rating scale (good), when compared to other samples. The fabric finished

by Nanoencapsulated method had good retention due to the herbal extracts imparted to the fabric.

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