



EFFECT OF DIFFERENT LAUNDRY DETERGENTS ON STAIN REMOVAL FROM NATURAL DYED COTTON FABRICS

Dr. Hemlata Padole

Sevadal Mahila Mahavidyalaya, Nagpur
E-mail: hema.padole@gmail.com

Communicated : 11.07.2023

Revision : 10.08.2023
Accepted : 16.08.2023

Published: 05.09.2023

ABSTRACT:

Cotton is the world's most used fiber. Cotton is a natural fiber and is used in a wide variety of clothing and home furnishings. It is a natural fiber that is obtained from cotton linters. The cotton is a relatively pure and inexpensive source of cellulose. Cotton has a combination of desirable properties which makes it suitable for many uses. It has properties of low cost, low resiliency, launderability, and absorbency. Cleanliness is important in human health and comfort; many people stain their clothes and don't know the best way to remove the stain. The main purpose of this study was to test and observe three different laundry detergents and how they affected stains. The methodology adopted for the study was to use Natural dye Palash (Badami) Colour and Natural dye Kacim (Black) colored cotton fabric and three commercial laundry detergents and three biological stains were selected. The purpose of the experiment was to determine which laundry detergent would best remove different types of stains by measuring the amount of stains removed. This study helps the consumer to understand which laundry detergent worked best.

Key words: - Cotton fabric, Detergents, Biological Stains, Natural dye.

INTRODUCTION :

Cotton is the most prevalent fiber in the world. Renowned for its breathability, strength, and versatility, cotton has helped shape the history of the world by clothing and protecting countless civilizations and adventurers from the effects of nature.

A stain is a dirty or discolored area on clothes. In our daily life, despite due care sometimes clothes are stained and they look very unattractive. Stains are spots or marks of discolouration, which is left on fabrics by the contact, and absorption of some foreign substances. Ordinary methods or reagents easily remove some stains. But there are quite a few, which need special treatment. This entirely depends on the nature of the stain.

Apart from the cleaning properties of the detergents the other area of concern is the colour fastness, which is a term used in the dyeing of textile materials, meaning resistance of the material's colour to fading or running. Thus, the quality of a fabric is the function of colour

fastness (for different dyes) and the reaction of detergents with the fabric and dyes (during the washing process). Detergents have been subject to constant improvements to increase their cleaning power, to better protect coloured clothing, and to have a lower environmental impact.

The endpoint for formulators for laundry detergents is consumer satisfaction. Thus, it is evident that the cleaning property of detergents as well as the nature of different dyes provides a dynamic situation that demands careful planning for the washing process for sustaining the quality of fabrics. Against the backdrop of the above information, this study was carried out to assess the impact of different commercially available laundry detergents on stain removal and color fastness of dyed cotton fabrics. The researcher was motivated to carry out research in this domain as it offers significant potential benefits through a closer understanding of the effectiveness of detergents, which are an essential commodity of human life.

The specific objectives of the study were as under.

OBJECTIVES OF THE STUDY :

1. To standardize the dyeing procedure by using 100% branded cotton fabrics.
2. To standardize the staining procedure of the cotton fabrics.
3. To test the effect of laundry detergents on the removal of stains from dyed cotton fabrics.
4. To observe the effect of color fading of the dyed fabric in the process of stain removal and laundering.
5. To suggest the most effective laundry detergent based on its property of stain removal and color fastness.

MATERIALS AND METHODS:

100% pure Natural dye Palash (Badami) Colour and Natural dye Kacim (Black) colored cotton fabric samples of size 10 cm x 10 cm were taken for the study, each sample was spotted with three different biological stains such as Blood, Curry, and Heena. A set of these spot-stained samples were Fresh and set for 6 hours. Three types of laundry detergents were selected i.e. Surf Excel, Tide, and Wheel.

The researcher applied two methods of stain removal process. One is room temperature of water and the second is 60^oc temperature of water was used. Both methods spotted samples were immersed with each detergent solution for 15 minutes. The amount of stain removed was noted down. The amount of stain removed was assessed by comparing the treated samples with control (Stained) samples and were denoted as, rating 5 was denoted as stain undetectable similarly very slight staining was denoted as rating 4, slight staining was denoted as rating 3, moderate staining was denoted as rating 2 and heavy staining was denoted as rating 1. Also, the coloured fabric was compared with the original coloured sample for fabric color and denoted as having no effect with rating 1, very

slight fade with rating 2, and strongly faded with rating 3.

RESULT AND DISCUSSION:

Fig 1. demonstrates information about the effect of different detergents on blood curry and henna stain removal from cotton fabric coloured with natural dye palash (badami) colour at different time duration. It was observed that for removal of blood stains, Tide and wheel detergents indicated a rating of 1.7 at 0th hour, detergent surf Excel showed a rating of 2.7 at 0th hour, whereas all detergents (SE, Td, and Wh) showed a rating of 1.0 at 6th hour.

Furthermore for the removal of curry stains from natural palash (Badami) coloured cotton fabric detergents SE showed a rating of 3.7 at 0thhour, and Tide and wheel detergent indicated a rating of 2.7 at the 0th hour. All detergents (SE, Td, and Wh) showed a rating of 2.7 at the 6th hour.

Moreover for the removal of henna stains from palash-coloured cotton fabric, all detergents (SE, Td, and Wh) indicated a rating of 1.0 at the 0th, and 6th, hours.

- From the study results it was observed that the stain removal ability of the different detergents from the colored cotton fabrics varied considerably, specifically, for the blood stains, For removal of Blood stains detergent SE is found to be the most effective detergent. Tide and wheel detergents are found to be equally efficient at the 0th and 6th hour.

- For the removal of curry stains detergent SE is found to be the most effective detergent, whereas, for the removal of henna stains, all detergents are equally effective.

- From the study results it was observed that blood and curry stain removal ability of the different detergents varied significantly at different time intervals.

Fig 2 demonstrates information about the effect of different detergents on blood, curry, and henna stain removal from cotton fabric colored

with natural dye Kacim black colour at different time durations. It was observed that for the removal of blood stains detergents SE and Td indicated a rating of 2.7, and wheel detergents indicated a rating of 1.7 at the 0th hour. All detergents (SE, Td, and Wh) showed a rating of 1.7 in 6th hour

Furthermore for the removal of curry stains from natural kacim black coloured cotton fabric detergents SE, Tide, and Wh showed a rating of 3.7 at 0thhour, and detergents (SE, Td and Wh) indicated a rating of 2.7 and 1.5,at the 6th hour respectively.

Moreover, for removal of henna stains from kacim black coloured cotton fabric, all detergents (SE, Td, and Wh) indicated a rating of 1.0 at 0th hour whereas all the detergents (SE, Td, and Wh) indicated a rating of 1.7 at the 6th hour.

- From the study results it was observed that the stain removal ability of the different detergents from the colored cotton fabrics varied considerably, specifically, for the blood stains, detergents, SE is found to be the most efficient detergents at 0th hour.
- For the removal of curry stains detergent SE is found to be the most effective detergent, whereas for the removal of henna stains, all detergents are equally effective.
- From the study results it was observed that blood and curry stain removal ability of the different detergents varied significantly at different time intervals.

CONCLUSION :

The study result showed that all three detergents work effectively on Blood, Curry, and Heena stains, for the 0th hour and set for the 6th-hour stains. Set stains took more time to be removed than fresh stains. Each stain and detergent has its own performance profile. Remove stains while they are fresh. Time delay enhances the fixation of stains with fabric.

REFERENCES :

- The story of the importance of cotton.
- Which Laundry Detergent Is Best At Removing Stains From Clothes -Ben Monroe (2013)
3. Fiber Facts- Information for different types of textile fibers
- Comparative study of washing fastness of vat and reactive dyed fabric samples – (Iftikhar Ahmad, 2001)
- Cotton History- Ruchi Global Limited. The effect of different detergents on the removal of stains – Carrie N.
- Padole H, Nasre M, The Impact of Different Laundry Detergents on Stain Removal and Colour Fastness of Dyed Cotton Fabrics, Ph.D. Thesis Submitted at RTM Nagpur University, Nagpur, 17 August 2013.
- Mahdessian J., Comprehensive stain removal kit and method with absorbent backing material, 2005.

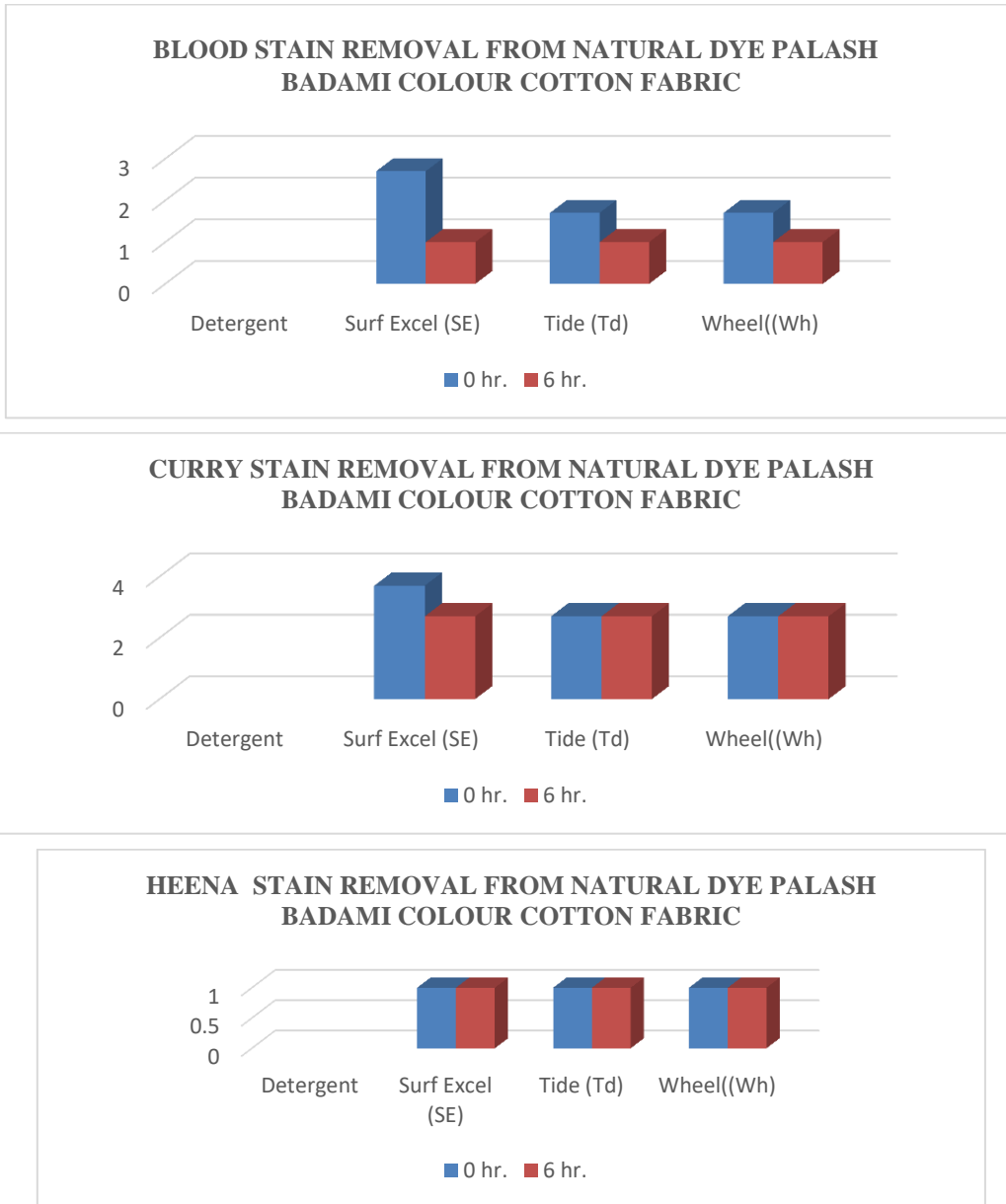


Fig 1

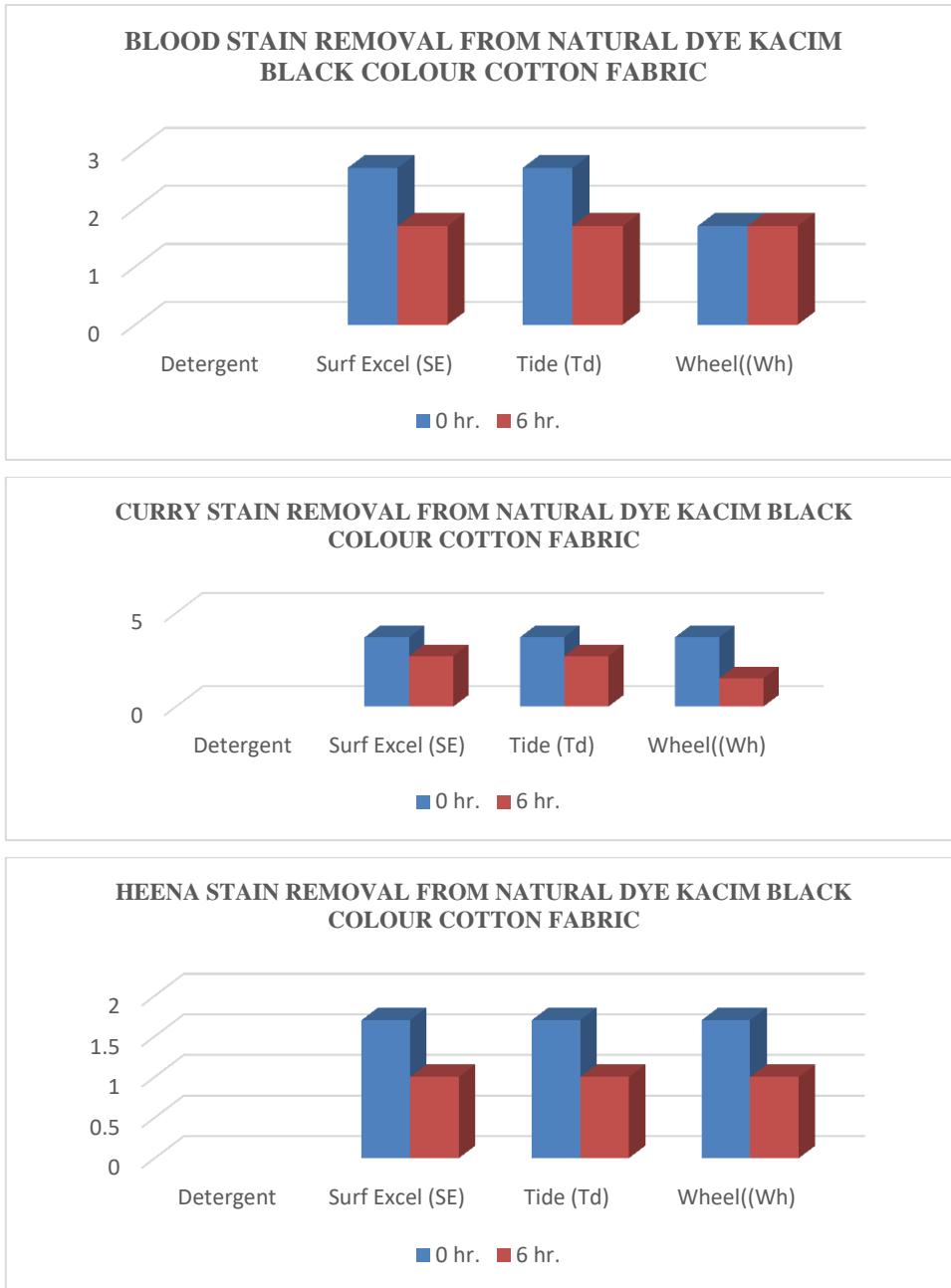


Fig 2