



## EFFECT OF DIFFERENT LAUNDRY DETERGENTS ON STAIN REMOVAL FROM NAPHTHOL DYED COTTON FABRIC

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### ABSTRACT:

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 Naphthol dyed Red and Brown coloured cotton fabric and four commercial laundry detergents and five biological stains were selected. The experiment aimed 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, Naphthol dye.

### INTRODUCTION :

Cotton is the world's most used fiber. Every part of the cotton plant is useful. The fiber is the most important part of the plant because it is used to make cotton cloth. A special group of dyes is formed by the naphthol dyes (Naphthol AS®), where the azo dye is synthesized directly on the fabric. The name of this group of dyes originates from  $\beta$ -naphtholate as one of the first naphthol components used for the azo coupling. Naphthol dyes are also called **azoic dyes** because their molecules hold an azo group. Cotton, rayon, and other cellulosic fibers, as well as silk, can also be dyed with azoic or naphthol dyes. Naphthol dyes are true cold water dyes. Azo dyes are the most diverse group of synthetic dyes. Azo dyes are prepared in two steps. The diazonium salt is produced in the first step, which then reacts with highly reactive aromatic compounds such as phenol is the second step. Different pathways are followed to obtain the desired color properties of dyes. Clothes become soiled as they are worn or used and hence require cleaning to maintain their appearance. A stain is a dirty or discolored area

on clothes. In our daily life despite due care sometimes clothes are stained and they look unattractive. Stains are spots or marks of discoloration, which is left on fabrics by the contact and absorption of some foreign substances. Ordinary methods or reagents easily remove some stains. But their quite a few, that need special treatment. This entirely depends on the nature of the stain. Stain removal is a skill that calls for long experience and demands special attention. The two essential factors to be considered in stain removal are the composition, colour of the fabric, and the nature and age of stain.

The home laundry process is required to provide a multitude of benefits. The most important is cleaning. We also want our clothes to be whiter than white and our coloured thing to be brighter than bright.

Many stains may be removed from clothing and household furnishings, increasing their quality and prolonging their useful life. A Stain is a chemical reaction between the staining agent and the fibers and finishes of a fabric. There is no single product or method for removing all

stains because the chemical makeup of each stain and agent is unique. "Old" stains are more difficult to remove than "Fresh" ones.

#### **MATERIAL AND METHOD:**

100% pure Naphthol dyed Red and Brown coloured cotton samples of size 10 cm. x 10 cm. were taken for the study. Each sample was spotted with four different biological stains such as Blood, Henna, Curry, and Turmeric. A set of these spot-stained samples were fresh and set for Twelve hours. Four types of laundry detergents were selected i.e. Ariel Oxy Blue(Ar), Surf Excel(SE), Tide(Td) and Rin (Rn).

Spotted samples were immersed in each detergent solution for 15 minutes. The amount of stain removal was noted down. The amount of stain removed was assessed by comparing the treated samples with control(stained) samples and denoted as a rating **5** was denoted as stain undetectable similarly very slight staining was denoted as a rating of **4**, slight staining was denoted as a rating of **3**, moderate staining was denoted as rating of **2** and heavy staining was denoted as rating of **1**.

#### **RESULT AND DISCUSSION:**

Efficacy of detergents in removing stains on Naphthol Dyed Red coloured cotton fabrics.

**Fig. 1** shows information pertaining to the effect of different detergents on blood, curry, and henna stain removal from cotton fabric coloured with naphthol dye red colour at different time duration. It was observed that for the removal of blood stain detergent SE indicated a rating of 5 at the 0<sup>th</sup> hour, whereas all detergents (Ar, Rn, SE, and Td) indicated a rating of 4.7 at the 0<sup>th</sup> hour.

Furthermore, for the removal of curry stains from naphthol red-colored cotton fabric all detergents (Ar, Rn, SE, and Td) showed a rating of 4.7 at the 0<sup>th</sup> and 12<sup>th</sup> hour.

Moreover, for the removal of henna stains from red-colored cotton fabric, all detergents (Ar, Rn, SE, and Td) indicated a rating of 4.7 at the 0<sup>th</sup>

hour. whereas all the detergents (Ar, Rn, SE, and Td) indicated a rating of 3.7 at the 12<sup>th</sup> hour.

Moreover, for the removal of turmeric stains from red-coloured cotton fabric, all detergents (Ar, Rn, SE, and Td) indicated a rating of 4.7 at the 0<sup>th</sup> and 12<sup>th</sup> 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, detergent SE is found to be the most efficient detergent among all the selected detergents.

- For removal of curry and henna stains all detergent are found to be equally effective
- From the study results it was observed that blood, curry and henna stain removal ability of the different detergents varied considerably.

Efficacy of detergents in removing stains on Naphthol Dyed Brown coloured cotton fabrics.

**Fig.2** shows information pertaining to the effect of different detergents on blood, curry and henna stain removal from cotton fabric coloured with naphthol dye Brown colour at different time duration. It was observed that for the removal of blood, curry, henna, and turmeric stains all detergents (Ar, Rn, SE, and Td) indicated a rating of 4.7 at the 0<sup>th</sup> and 12<sup>th</sup> 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 removal of blood, curry, henna, and turmeric stains, all the detergents were found to be the most efficient detergent at the 0<sup>th</sup> and 12<sup>th</sup> hours.

#### **CONCLUSION :**

The study result showed that all three detergents work effectively on Blood, Curry, Henna, and Turmeric stains, for the 0<sup>th</sup> hour and set for 12th-hour stains. Set stains took more time to be removed than fresh stains. But Surf Excel detergent works best on Turmeric stains for 0<sup>th</sup> and set for 12th-hour set stains.

Each stain and detergent has its performance profile. Remove stains while they are fresh. Time delay enhances the fixation of stains with fabric.

#### REFERENCES :

Ahmad I, Jamil N.A., Athar A., Comparative study of washing fastness of Vat and Reactive Dyed Fabric Samples, Pakistan Journal of Applied Sciences 2001;1(3):413-416.

Bubl J. L., Laundering Cotton Fabric, Part I: Effects of Detergent Type and Water Temperature on Soil Removal, Textile Research Journal, 1970; 40(7): 637-643.

Higgins L. , Anand S. C. , Holmes D. A. , Hall M. E. , Underly K. , Effects of various home laundering practices on the dimensional stability, wrinkling, and other properties of plain woven cotton fabrics. Part I: Experimental overview, reproducibility of results, and effect of detergent, Textile Research Journal Article date April 1, 2003.

[http://www.washwise.org.au/\\_documents/Laundry%20detergent%20ingredients%20info%20sheet.pdf](http://www.washwise.org.au/_documents/Laundry%20detergent%20ingredients%20info%20sheet.pdf)

Mahdessian J., Comprehensive stain removal kit and method with absorbent backing material, 2005.

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.

Padole H., Effect of Different Laundry Detergents on Stain Removal From Reactive Dyed Cotton Fabric, I J R B A T, Sp. Issue (18) June 2021: 33-37

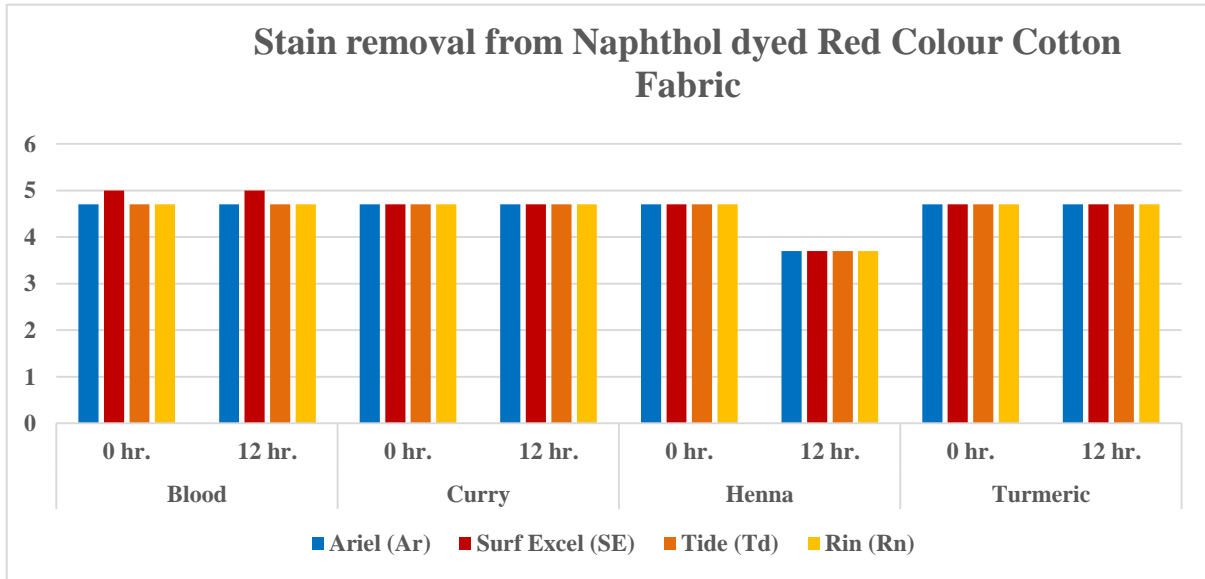


Fig. 1

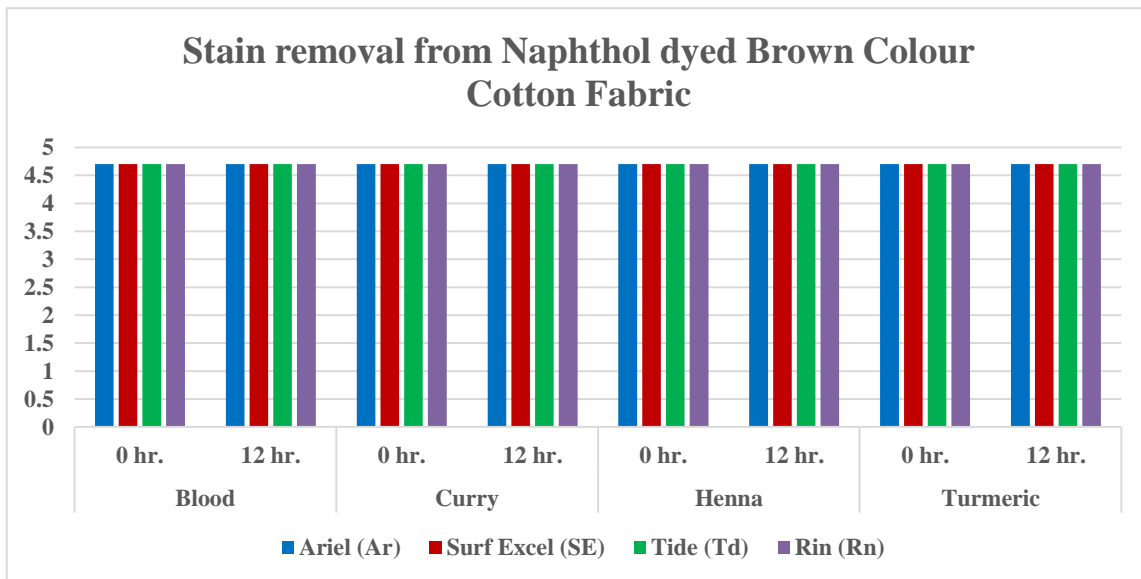


Fig.2