COHERENCE – The Multidisciplinary Research Journal
Volume No: 17, Issue No: 2, Year: 2026 (November)
PP: 116-124
ISSN: 0976-5301
Peer Reviewed & Refereed Journal (IF: 7.85)
Journal Website www.coherencejournal.in

"TEXTILE TRANSMUTATION: THE CHEMICAL AND VISUAL MECHANICS OF BLEACH-BASED PAINTWORK ON INDIGO TEXTILES." AN EXPERIMENTAL RESEARCH

Harshita Verma

Assistant Professor, Department of Fashion Designing, A.S. College for Women, Khanna
Affiliated: Panjab University, Chandigarh

Nitika Sharma

Assistant Professor, Department of Fashion Designing, A.S. College for Women, Khanna
Affiliated to Panjab University, Chandigarh

ABSTRACT

This project explores the unconventional art form of painting with bleach on denim fabric. By examining the chemical interactions between bleach and denim fibers, various artistic techniques, and the aesthetic appeal of the medium, this study aims to establish bleach painting as a legitimate and expressive form of textile art. Additionally, it considers the sustainability and environmental implications of this method in contemporary art and fashion.

Keywords: Bleach Painting, Denim Fabric, Textile Art, Fabric Manipulation, Chemical Interaction, Sustainable Fashion, Textile Design, Creative Expression, Surface Design, Upcycling, Contemporary Art, Eco-Friendly Fashion.



CHAPTER 1

INTRODUCTION

The **bleaching** is one of the steps in the textile manufacturing process. The objective of bleaching is to remove the natural color for the following steps such as dyeing or printing or to achieve full white. All raw textile materials, when they are in natural form, are known as 'greige' material. They have their natural color, odor and impurities that are not suited to clothing materials. Not only the natural impurities will remain in the greige material, but also the add-ons that were made during its cultivation, growth and manufacture in the form of pesticides, fungicides, worm killers, sizes, lubricants, etc. The removal of these natural coloring matters and add-ons during the previous state of manufacturing is called scouring and bleaching.

A **continuous bleaching** range is a set of machines to carry out bleaching action. It consists of several compartments in which fabric moves from one side to another with the help of guide rollers and is treated with chemicals, heated, rinsed, and squeezed. Continuous bleaching is possible for the fabrics in open-width or rope

ISSN: 0976-5301
Peer Reviewed & Refereed Journal (IF: 7.85)
Journal Website www.coherencejournal.in

form. Bleach, primarily sodium hypochlorite or hydrogen peroxide, plays a pivotal role in denim processing, acting as a crucial agent in lightening the fabric's color. This chemical treatment is essential for achieving a wide range of denim shades, from subtle fades to dramatic, almost white effects. Denim bleaching involves immersing the fabric in a bleach solution, either directly or diluted with water. The intensity of the bleaching effect is determined by the concentration of the bleach and the duration of the treatment. To prevent further damage to the fabric, the bleachingprocess is halted by neutralizing the bleach with anti-color agents such as sodium metabisulfite. Excessive bleach usage can weaken the denim fibers, resulting in increased softness but potentially compromising the fabric's durability. Denim washing has evolved into a sophisticated art form, with bleach washes playing a crucial role in achieving diverse aesthetics. From subtle fades to dramatic bleaching effects, these techniques enhance denim's appeal and contribute to its enduring popularity. The dyeing and finishing processes of readymade jeans have become increasingly sophisticated in recent years, driven by the growing demand for fashionable and comfortable denim wear. Designers continually explore innovative modifications and styling techniques to attract a discerning and ever-growing customer base. **Denim has long been a staple material in fashion and design. While traditional methods of embellishment include dyeing, embroidery, and screen printing, the use of bleach as a painting medium has gained popularity as an innovative technique. This study investigates the artistic and scientific aspects of bleach painting on denim, assessing its potential for both creative expression and sustainability.**

Chemical Interaction of Bleach with Denim Fibers Bleach, primarily composed of sodium hypochlorite, breaks down the indigo dye in denim through an oxidation process. This reaction leads to a fading or complete removal of color, revealing lighter shades or white areas on the fabric. Factors such as fabric composition, bleach concentration, and application technique influence the final outcome. According to Smith and Jones (2018), sodium hypochlorite's oxidative properties can weaken fabric integrity over time, making controlled application crucial for artistic and practical purposes. While effective in lightening denim, excessive bleaching can weaken fibersand potentially damage the fabric. Bleaches can be harmful. Inhalation of fumes, skin contact, or ingestion can cause health issue.





ISSN: 0976-5301
Peer Reviewed & Refereed Journal (IF: 7.85)
Journal Website www.coherencejournal.in

CHAPTER 2

LITERATURE REVIEW

BLEACHING

The term "bleach" originates from a French world signifying "to whiten" in essence, the process of bleaching involves whitening by removing substances that impart color to the material undergoing the bleaching treatment. Bleaching is the process of decolorizing the material after it has been scoured. Bleaching agents attack the chromophores and alter the color absorbing properties of the objects. The chemical used as bleaching agent are chlorine, hydrogen peroxide, and sodium hypochlorite a strong oxidizing agent that bleaches bacteria also used to disinfect swimming pool. Bleaching with sodium hypochlorite is by far the most common bleaching process. It is used when the indigo's color needs to be lightened as required by fashion, as well as to clean up the pocket linen and the inner face of the jeans (weft). This particular bleaching process is preferably used whenever a strong contrast between blue and white fibers is desired since it gives the bluest cast of all bleaching processes.

PURPOSE OF BLEACHING

Bleach is the generic name for any chemical product that is used industrially or domestically to remove color from (i.e. to whiten) fabric or fiber (in a process called bleaching) or to disinfect after cleaning. It often refers specifically to a dilute solution of sodium hypochlorite, also called "liquid bleach "Bleaches work by reacting with many colored organic compounds, such as natural pigments, and turning them into colorless ones. While most bleaches are oxidizing agents , some are reducing agents.Bleaching is a crucial step in denim finishing, primarily used to achieve desired fading effects and soften the fabric. It involves treating denim with chemicals, typically sodium hypochlorite or hydrogen peroxide, to lighten the color. This process also removes starch and sizing agents from the fabric**.**

ALTERNATIVES THAT WERE USED WHEN CHEMICAL BLECHES WERE NOT INTRODUCED:

1. **Leamon juice**
2. **Baking soda**
3. **White vinegar**
4. **Utilizing sun for eco-friendly bleaching.**

CHAPTER 3

METHODOLOGY

THIS CHAPTER deals with the methodological procedures through which data is collected. It presents the description of the research design, study area samples and sampling techniques.

TOPIC SELECTION:

The purpose of selecting this specific topic is to meet fashion with science that how oxidizing and reducing agents present in bleach reach with denim and effect the strength of the fabric, determining cause-effect relationship.

DATA COLLECTION METHODS:

The data in this project is collected through online, experiments and observations. Analyzing the whole process and coming to a conclusion.

DESIGN OF THE STUDY

The design is based on the experiments using bleach of different kinds on denim to study its results and adapting different artistical techniques.

SAMPLING:

Preparing swatches first to see before and after effect of different bleach and to record which bleach shows the best result and is more productive.

PHYSICAL OBSERVATION

Analyzing bleach effect on denim using different artistical techniques with different bleaches and different time for resting it.

ISSN: 0976-5301
Peer Reviewed & Refereed Journal (IF: 7.85)
Journal Website www.coherencejournal.in

CHAPTER 4

TECHNIQUES

THE objective of this study is to find the artistic ways of bleaching fabric (denim) Through different techniques of bleach painting. TO assess the effectiveness of bleach in discolorations or oxidizing of the denim to change its color. THE several methods can be employed to create unique artistic effects on denim:

1. FREEHAND PAINTING– Using brushes or cotton swabs to apply bleach directly to fabric, allowing for detailed and intricate designs (Brown, 2020).
2. STENCIL APPLICATION– Placing stencils on denim and applying bleach around or within the design to create sharp patterns (Miller & Thompson, 2019).
3. SPRAY AND SPLATTER METHODS– Using spray bottles or flicking bleach onto the fabric to create a diffused or abstract look (Anderson et al., 2021).
4. RESIST TECHNIQUES– Applying wax, tape, or other resist materials to certain areas before bleaching to preserve original colors and create contrast (Garcia, 2017).
5. DIP-DYEING AND GRADIENT EFFECTS– Submerging sections of denim into bleach solutions for controlled fading and ombré designs (Lee, 2018).

Aesthetic and Cultural Significance The visual appeal of bleach-painted denim lies in its organic, high-contrast designs that range from bold graphic imagery to subtle watercolor-like patterns. This technique has been embraced by contemporary artists and fashion designers as a means of self-expression, customization, and sustainable creativity (Williams & Patel, 2022). Furthermore, historical examples of resist-dyeing and bleaching methods in various cultures provide context for its artistic evolution.

Sustainability and Environmental Considerations While bleach is a powerful artistic tool, its environmental impact raises concerns. The disposal of bleach solutions must be managed responsibly to prevent water pollution. Research by Green et al. (2021) highlights the effects of sodium hypochlorite on aquatic ecosystems, emphasizing the need for controlled use and proper waste disposal. Additionally, artists and designers are exploring eco-friendly alternatives such as lemon juice, hydrogen peroxide, and sunlight bleaching to reduce chemical waste (Chen, 2020).

Painting with bleach on denim is a dynamic and innovative art form that combines chemistry with creativity. Its ability to transform fabric through oxidation offers artists a unique medium for expression while promoting sustainable design practices.

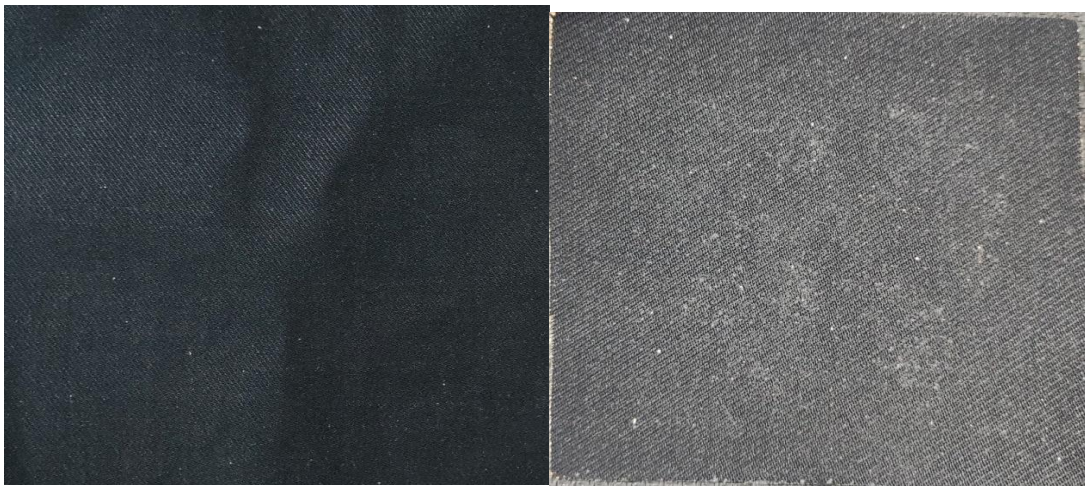
CHAPTER 5

TESTED SAMPLES ITS RESULT AND DISCUSSION

1. LEMON: Applied non diluted lemon juice on the centerof swatch and leaved it for one hour in sun.



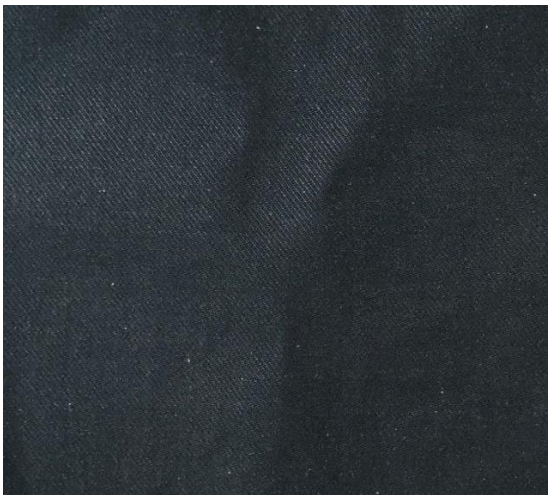
ISSN: 0976-5301
Peer Reviewed & Refereed Journal (IF: 7.85)
Journal Website www.coherencejournal.in

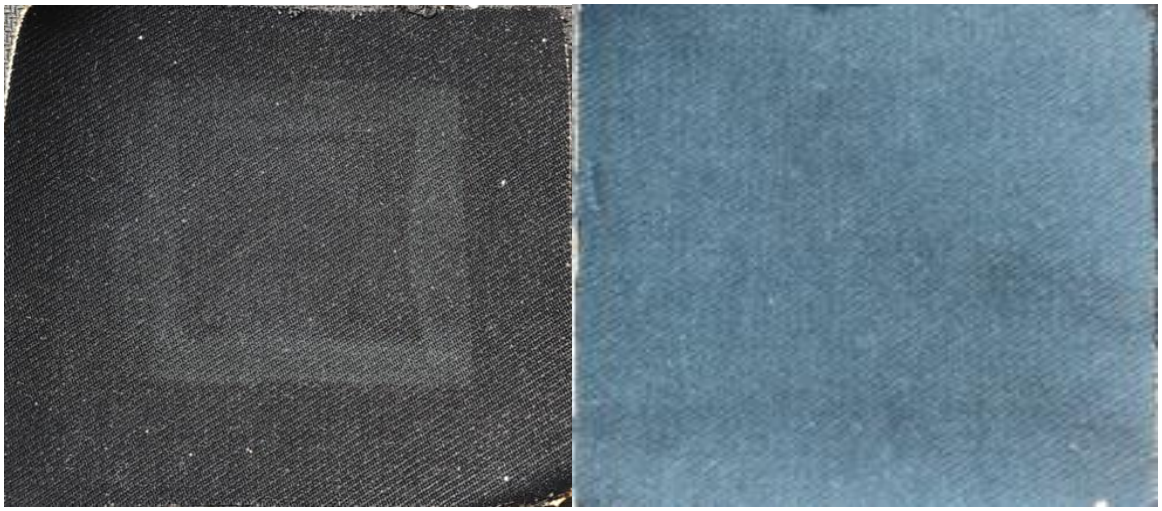


RESULTS: A little spotting nothing extra slightly visible not suitable for thick fabrics only good for fabric like linen.

2. RIN ALA BLEACH: FIRST TEST (UNDILUTED) A little change where first applied leaved it for 30 min to see if needs more time but nothing so I tested again to if I am doing anything wrong. SECOND TEST (diluted in water with 3/1 ratio of water and bleach) This it worked pretty well I soaked it in the solution for 1hr to see more results but 30 min were sufficient. it changed its shade from blackish blue to air for ceblue.



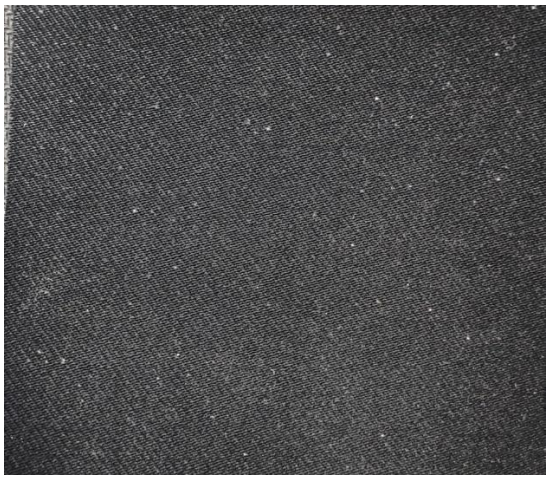




ISSN: 0976-5301
Peer Reviewed & Refereed Journal (IF: 7.85)
Journal Website www.coherencejournal.in

3. FABRIC WHITENER:No change left it for 1hr.





4. DRY BLEACH: It is a yellowish-white powder with a strong smell of chlorine and is soluble in water. Aqueous solution of bleaching powder contains chloride and hypochlorite ions. 2 spoons of dry bleach powder with half a cup of water putted in a spray bottle and sprayed onto the fabric.

Chlorine bleach with 5.25 percent solution of sodium hypochlorite must be diluted with water for safe use (oneis tothree ratio) liquid version is most common dry also available bus have to be very cautious while using because of its harmful fumes proper gloving and mouth should be covered.





ISSN: 0976-5301
Peer Reviewed & Refereed Journal (IF: 7.85)
Journal Website www.coherencejournal.in

CHAPTER 6

TYPES OF TECHNIQUE USED

Technique refers to the method and skills used by artist to create their art work. Applying different technique to achieve the desired effect. These techniques can be broadly categorized into different ways to create different effects

1. **HAND PAINTING: Hand painting is a technique for decorating fabric by applying fabric paint onto the material using brushes and other mediums. On this research project fabric bleach was used instead of fabric colors.**
2. **RESIST TECHNIQUE (BATIK):** Batik is a "resist" process for making designs on fabric. The artist uses wax to prevent dye from penetrating the cloth, leaving "blank" areas in the dyed fabric. The process, wax resist then dye, can be repeated over and over to create complex multicolored designs.
3. **SALT TECHNIQUE:** Salt reacts to the water in your watercolor paint. When sprinkled onto your painting surface, the salt granules can absorb the water, pulling it into a little star-like shape with textured edges. It creates tiny patches of lightness within the painting where the pigment is moved around, giving a sparkly or dappled effect. This time instead of using with water color and paper, fabric was used (denim) with bleach.
4. **DRY BRUSHING:** The secret to dry brush painting is to apply the paint with the very tip of your brush. Work with a clean, dry brush and scrub it over the surface you're painting. Use a stabbing motion to really push the paint into any crevices. instead of color bleach was used.
5. **SPONGE:** it is like other techniques of painting this time brushes were of no use only sponge was used
6. **DYEING (TIE&DYE)**: Tie-dye is a textile art form that uses various colors of thread as a way to create unique designs on fabric. The process of tie-dyeing is simple, but the resulting designs can be extremely colorful and intricate. Tie-dye can be used to create virtually any type of fabric, from clothing to pillows to blankets.
7. **DIP DYEING:**Dip dyeing is an ancient textile dyeing method that has stood the test of time. With roots dating back centuries, this technique involves immersing fabric or yarn partially into a dye bath, resulting in stunning color transitions and gradients.

CREATIVE SAMPLES



ISSN: 0976-5301
Peer Reviewed & Refereed Journal (IF: 7.85)
Journal Website www.coherencejournal.in

1. HAND PAINTING WITH DRY BRUSHING AND SPONGE

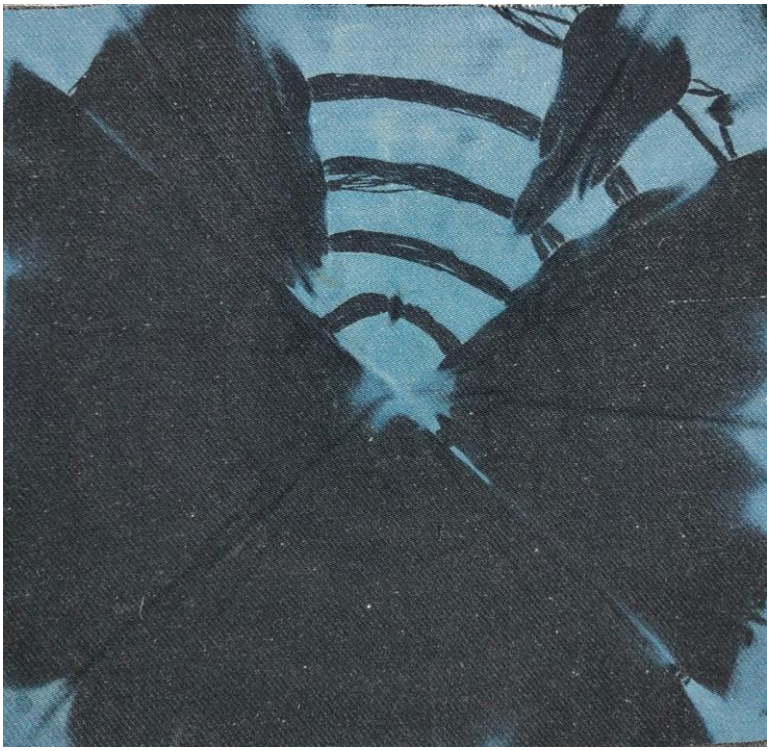


2. BATIK USING MELTED WAX



3. **SALT TECHNIQUE(firstly dipped in the bleach soaked well and after taking out while it was dripping wet, sprinkled some salt on top and leaved it to dry)**

ISSN: 0976-5301
Peer Reviewed & Refereed Journal (IF: 7.85)
Journal Website www.coherencejournal.in



4. TIE AND DYE (SPIRAL)

CONCLUSION

Painting with bleach on denim is a dynamic and innovative art form that combines chemistry with creativity. Its ability to transform fabric through oxidation offers artists a unique medium for expression while promoting sustainable design practices. While using different Indian art forms mentioned above and mixing two opposite things and using it for new creation and experimenting its work use in future. Further research into safer bleaching agents and their artistic potential can enhance this technique's viability in the future.

REFRENCES

1. Anderson, R., Thomas, L., & White, M. (2021). Experimental Textile Art: Innovative Techniques in Fabric Design. Oxford University Press.
2. Brown, K. (2020). Textile Creativity: New Frontiers in Fabric Art. Cambridge University Press.
3. Chen, Y. (2020). "Eco-Friendly Alternatives in Fabric Design." Sustainable Fashion Journal, 15(3), 125-138.
4. Garcia, P. (2017). Resist Dyeing and Fabric Manipulation Techniques. Artisan Publishing.
5. Green, D., Patel, S., & Kim, H. (2021). "The Environmental Impact of Textile Chemical Treatments." Journal of Sustainable Textiles, 10(4), 233-245.
6. Lee, J. (2018). Fabric Dyeing and Surface Design. Thames & Hudson.
7. Miller, C., & Thompson, B. (2019). "Innovations in Textile Decoration." Fashion and Textile Review, 7(2), 98-114.
8. Smith, A., & Jones, B. (2018). "Chemical Interactions of Bleaching Agents with Natural and Synthetic Fibers." Textile Chemistry Review, 5(1), 45-67.
9. Williams, T., & Patel, R. (2022). "Denim Customization: The Intersection of Fashion and Art." International Journal of Fashion Studies, 12(1), 67-89