

Exploring Color Fastness and Textile Properties in Traditional Alaari Fabrics of the Ondo Yoruba People of Nigeria

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Abstract

Traditional hand-woven fabrics (Aso Oke) play a vital role in Yoruba culture, especially during special events; however, the use of older fabrics like Alaari is declining. Nevertheless, the Ondo-Yoruba people continue to preserve and repurpose these traditional textiles. This study investigates the color fastness and textile properties of Alaari fabrics to assess their aesthetic and economic value in relation to their age. A laboratory rubbing test was conducted on 60 samples of used Alaari fabrics to evaluate their yarn, dye, and texture. Data were collected through oral interviews and observations. The results from the rubbing test revealed that most Alaari fabrics exhibited minimal color bleeding when dry, with fabric number 53 achieving the highest score of 2.5. However, over 90% of the fabrics were not colorfast, contradicting the common belief that older Alaari fabrics possess greater colorfastness than newer ones. This study concludes that there is no significant relationship between the economic value of old Alaari fabrics and their color fastness.

Keywords: Color fastness, Textile Properties, Traditional Alaari Fabrics, Ondo-Yoruba People.

Introduction

Nigeria is a country with many crafts, including mat weaving, wood carving, pottery, dyeing, and weaving, among others. Weaving is a craft passed down from one generation to another and has been described as one of the oldest crafts practiced in Nigeria. The Yoruba people are renowned for the production of traditional clothes, which are called hand-woven textile Aso-Oke. There is evidence of the Yoruba's long use of hand-woven fabrics for their clothing, ranging from everyday use (work clothes, blankets) to ceremonial purposes, such as the commemoration of traditional events like weddings, coronations, chieftaincy, age passage, and burials of the aged, as well as for

religious and ritual purposes (Adepeko, 2016). Examples of such woven fabrics include sanyan, etu, shin-shin, onjawu, and alaari. These hand-woven fabrics are sewn into different styles, such as agbada, dansiki, and sokoto for men, and iro, buba, and gele for women. In a nutshell, before contact with Western dress culture, the main focus of dressing was hand-woven fabrics because there were no alternatives.

The Ondo people's weaving practices, products, and uses, especially before independence, are not different from those of other Yoruba ethnic groups. In the past, women in Ondo planted cotton seeds, and the cotton fibers were spun into yarn, which was subsequently woven into fabrics. Ademuleya (2002) and Adepeko (2009), in their studies of the Ondo people and their weaving crafts, reveal that weaving was done mainly by women on vertical looms, and the product was called poku. Poku was used by women as wrappers and served as blankets for men at night. There is also evidence of silk weaving in Ondo. Silk fibers from anaphe caterpillars were manually processed into yarn for weaving at home, while the silk worms were roasted and eaten as a special delicacy. Ene (1984) asserts that in Ondo, silk from the wild anaphe caterpillars (called ewuuku in Ondo) was processed and spun by hand into a coarse thread used for weaving sanmiyan. Chinwike (1984) also mentioned that Ondo was one of the major silk weaving centers in Yoruba land. He recounted his meeting with the family of Alfa Yesufu, of 14 Igbonmoba Street, Ondo, whose sanmiyan silk cloth was the purest ever. Not only this, but Alfa Yesufu's family had practiced the art of silk weaving for at least one hundred and fifty years or even longer, with Chinwike estimating they had been doing so since about the 18th century.

Ademuleya (2002) and Adepeko (2009) further indicated that woven fabrics from the horizontal loom were introduced to Ondo from other Yoruba weaving towns such as Iseyin and Ilorin. Additionally, decades ago, male weavers and Aso-Oke traders from other Aso-Oke-producing towns came and settled in Ondo with their crafts and products. Some of their descendants are still in Ondo to this day. They introduced the techniques of weaving on the horizontal loom. Their products include alaari, sanyan, etu, petuje, and other Aso-Oke types of the Yoruba people.

Although the Ondo Yoruba people are weavers of alaari, they are also extravagant users. Despite the love, value, and premium placed on alaari fabric, there are challenges and limitations to using it. These include poor color fastness because the old alaari types were dyed with natural dyes, whose colors are not as fast as those of synthetic dyes. Akintayo (2009) noted that traditionally,

dyers used natural dyes extracted from flowers, roots, leaves, and bark of plants to dye the yarn used for the production of hand-woven textiles. Although the use of synthetic dyes has replaced natural dyes, these natural dyes are not without their limitations. Most of the time, they are not colorfast.

Scholars have identified some problems associated with the use of natural dyes, such as the tedious nature of their production, poor dye yield on extraction, limited range of shades, and poor to moderate fastness to washing and light. Synthetic dye was developed to address the deficiencies associated with the use of natural dyes (Hunger, 2003). Although the emergence of synthetic dyes has been a relief to dyers, as it addresses some of the problems still encountered, studies by Simpton (2004), Renne (1994), Wilson (2002), and Oyelola (2007) indicate that issues of poor color fastness on fabrics persist with both synthetic and natural dyes. However, a study by Akintayo (2009) reveals that color bleeding occurs not only on traditional woven fabrics. There have been cases of color bleeding and fading in other fabrics, such as batik, tie-dye fabrics, and machine-dyed fabrics like Ankara and Guinea brocade. Therefore, poor color fastness of textile products seems to be a major source of consumer complaints.

This study, therefore, seeks to explore color fastness and textile properties in traditional alaari fabrics of the Ondo Yoruba people of Nigeria. A survey and experimental research design, along with oral interviews and laboratory rubbing tests, were adopted for the study, with percentages used for data presentation.

Statement of the Problem

Alaari is crimson in color, originally made from silk and dyed with red camwood. Alaari fabrics were highly sought after in the past by the aristocratic class and the elite throughout Yoruba land because they were regarded as one of the prestigious dress fabrics for commemorating important events. Over the past decades, however, alaari has lost its value in Yoruba land, except among the Ondo Yoruba. For quite some time, the Ondo Yoruba have continued to purchase a greater number of alaari fabrics from other Yoruba communities due to their penchant for this fabric. They not only acquired the fabric but also the technology for its conservation and restoration, as the fabric is produced in limited quantities by weavers. Furthermore, the Ondo Yoruba place a high premium on the age of the fabric and have created new uses for very old pieces.

Since the Ondo people are still at the forefront of preserving and propagating a dying dress tradition, this study aims to ensure that such eclipsing (dying) African material culture is preserved for posterity. Especially at this time when the demand for locally produced fabrics is increasing, as people are beginning to return to the use of traditional fabrics (Collins, 2003). To maintain and meet this rising demand and achieve economic success, traditional weavers, dyers, and textile industries must embrace the spirit of producing high-quality products that meet international standards. One of the ways to achieve this is by producing fabrics that are colorfast.

Objective of this study were:

1. to carry out a laboratory rubbing test of 60 selected samples of used alaari fabrics to determine the colour fastness when dry and when wet.
2. to examine the textile properties (yarn, dye and texture) of the 60 selected used alaari fabrics.

Research questions

1. How will the colour fastness of the 60 selected used alaari fabrics will be determined and carried out?
2. How will the textile properties (yarn, dye and texture) of the 60 selected used alaari fabrics be determined?

Significance of the study

1. The study would be a source of extending knowledge on alaari which has least been investigated or re-investigated. Available information suggests that no investigation of the topic has been done in the past four decades or more.
2. The study would fill a gap in the realm of textile and costume history particularly in the preservation, conservation and re-use of African indigenous textiles in the contemporary times.

Scope

The study is to Explore Colour Fastness and Textile Properties in Traditional Alaari Fabrics of the Ondo Yoruba People of Nigeria.

Literature Review

The importance of color in textiles is ever-present and speaks louder than words. As an art form, it serves as a universal language with broad appeal to human taste. Therefore, its significance cannot be overemphasized. From time immemorial, dyes have been used to color textile materials such as fibers, yarns, and fabrics—both woven and dyed. Initially, these dyes were derived from

natural sources, including plants—leaves, twigs, roots, berries, and flowers—as well as animal substances. However, the growing desire for colorful textiles led to the discovery of synthetic dyes and the manufacturing of dyestuffs and chemical agents that produce long-lasting colors in various textile materials. Today, most dyes in use are synthetic. According to Jen (2000), the quest for highly colored and colorfast dyes has fueled major dye-producing industries from ancient times to the present. Nowadays, chemists are at the forefront of developing new dyes, altering the structures of known dyes, and inventing entirely new ones.

The quest for color is universal. According to Kadolph (2007) in Akintayo (2009), color is one of the most significant factors in the acceptability and marketability of textile products. Color is a crucial aspect of textile production because, as Elsasser (2007) asserts, consumers generally expect two things: aesthetically pleasing colors and prints, and permanence. This implies that the aesthetic aspects of a textile fabric are the primary considerations for consumers.

Textile Dyes

According to Joseph (1980), dyestuffs and dyeing are as old as textiles themselves and predate written history. He noted that fabrics with remnants of blue indigo dye dating from 3500 B.C. were found in Egypt. Additionally, ancient tombs contained fabrics colored yellow with dye obtained from the safflower plant. In China, Asia Minor, and parts of Europe, beautifully colored fabrics dating back several thousand years have been unearthed.

Types of Dyes/Dyestuffs

Azoic or Naphthol Dyes

Azoic or naphthol dyes are used for cellulosic fibers and, to a limited extent, for manufactured fibers such as nylon, acrylic, polyester, and polypropylene. These dyes produce color through a complex chemical reaction and are sometimes referred to as “ice” colors because they are applied from a low-temperature bath. Azoic dyestuffs produce brilliant and pastel colors at relatively low cost. They exhibit good colorfastness to laundering, bleaching, and light, making them suitable for fabrics used for towels, sheets, pillowcases, and similar items. The colors can withstand even the heaviest care procedures for soil and stain removal.

Pigment Dyes

Pigment colors may not be technically regarded as dyes; however, they are used in dyeing some textile fabrics. Pigment colors have no affinity for fibers, so they are attached to fibers or fabrics

by means of additives, resins, and binding agents. When additives are added to pigments, the colors become relatively permanent, but their durability is directly related to the stability of the binding agent. As the latter fades away, the colors also disappear.

Acid Dyes

Protein, acrylic, nylon, and some modified polyester fibers can be dyed with acid dyes. The dyeing process involves chemical reactions with the fiber molecules. Fibers affected by acid should be avoided due to potential damage. The colors achieved with acid dyes range from very bright to light and dark. Some fabrics dyed with this type of dye may not be colorfast; colors from acid dyes can fade quickly when exposed to light, during care, or from perspiration. Therefore, consumers of such fabrics should pay close attention to manufacturers' care instructions.

Disperse Dyes

Disperse dyes, initially known as acetate dyes, were originally derived from acetate fibers. They are used to dye textile fibers such as nylon, acrylic, and polyester. Disperse dyes are added to polyesters at temperatures below the boiling point, and carriers are required to facilitate the penetration of dye molecules into the fibers. Conversely, a combination of high temperature and pressure can successfully dye fibers with disperse dyes without carriers (Joseph, 1980). Fibers dyed with disperse dyes are generally colorfast.

Vat Dyes

According to Joseph (1980), vat dyes originated in Europe around 1910 and derive their name from the large vat used for applying the dyes to yarns and fabrics. Today, vat dyes can be applied in vats or through continuous field methods. Vat dyes are insoluble in water but dissolve in alkaline solutions. Their insolubility is what makes vat dye colorfast. Vat dyes are suitable for cellulose fibers and some newer man-made fibers and are available in a wide range of colors.

Dyes and Colorfastness

If all dyes were permanent and easy to apply, both consumers and manufacturers would not be concerned about the performance of colors on fabrics. It is important for colored textile fabrics to retain their colors throughout their service life; however, it is common for colored fabrics to fade due to repeated washing, constant exposure to sunlight, heat, and perspiration from body sweat. The fastness properties of fabrics are determined through these routine activities in maintaining fabric cleanliness.

a. Colorfastness to Washing This is an important property of textiles, ensuring that garments retain their vibrancy and color over time. It measures how well a fabric maintains its color and appearance after repeated washing. Factors that affect colorfastness to washing include:

(i) **Fiber Type:** Natural fibers such as wool and cotton are more likely to fade through washing than synthetic fibers like nylon and polyester.

(ii) **Fabric Construction:** Loosely woven fabrics are more prone to fading than tightly woven ones.

(iii) **Washing Conditions:** Prolonged exposure to water, the use of harsh detergents, and exposure to high temperatures can cause dyes to bleed or fade.

b. Colorfastness to Light This refers to a fabric's resistance to discoloration or fading when exposed to light. A part of the fabric exposed to a light source for a certain period will not be the same as the unexposed part. Changes in color can include alterations in hue, lightness, or chromatic characteristics. Colorfastness to light is important not only for textiles but also for plastics and paints, which can fade when exposed to artificial or natural light. Cloth and plastic manufacturers can improve colorfastness to light by using antioxidants, UV absorbers, and specialized coatings. These treatments can be applied during the manufacturing process or afterward.

c. Colorfastness to Perspiration This test measures how well a material resists fading or staining when exposed to sweat. Clothing and shoes are particularly susceptible to the effects of perspiration.

Methodology

Purposive sampling procedure was used for the selection of the 60 used alaari fabrics (from users) and the results were rated and were presented in charts and tables.

How the rubbing Test was Done

The tests to determine the color fastness (both dry and wet) for the sixty selected used alaari fabrics in this study were conducted at Yaba College of Technology, Lagos, in the Quality Control Laboratory of the Department of Polymer and Textile. The machine used for the rubbing test was the CROCK-O-METER. The testing procedure entails the following steps: The test entails the following procedures.

a. **The Conditioning:** This was done by numbering and arranging the alaari fabrics on tables in the laboratory. They were left on the tables for about one hour so that, they could have the same temperature with the laboratory room where the test took place in order to have the desired result from the research.

b. **The Dry Test:** One hundred and twenty pieces of square shaped white cotton cloth were cut. Two pieces for each alaari fabric, one for the dry test, the other for the wet test.

with the aid of a rubber band, a piece of the dry cotton was tied to the machines tub, and the alaari fabric to be tested, already laid on the lower platform of the machine, held in place with a device made of transparent plastic having a needlelike metal at both ends to firmly pin down the fabric while rubbing was on.

The tub was then lowered on the fabric, rubbed on the surface of the fabric, thirty times. The rubbing was done by manually moving the tub to and fro on the fabric. Then the dry piece of white cloth was removed and numbered for identification.

c. **The Wet Test:** The same procedure was employed except that the white pieces of cloth were dampened before tying to the tub. The dampening was necessary to create the needed wetness for the test. Both the dry and wet pieces were attached together.

The use of gray scale for assessing stain was employed to rate the degree of colour fastness of each alaari fabric when dry and when wet. The rating was done by placing each of the clothe against the scale to know the closet tone to the stain. The scale is a graduation of tones already rated and numbered as follows: 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, and 5. The rating of the sixty tested alaari fabrics are analyzed.

Rubbing Test Analysis

The fastness property of alaari was one of the variables for assessing the worth of this fabric. Rubbing test was done on the fabrics to ascertain the fastness property. Sixty alaari fabrics were collected from members of the community who were known to be owners of the fabrics. They were gotten from men and women, the commoners and the nobility in Ondo town. The fabric yarns were also examined to determine whether they were hand or machine spun. For the hand and machine spun (see Table 3).

Table 1, 2 and 3 shows the frequency distribution of the ratings for both dry and wet tests respectively.

Table 1: Analysis of the Rubbing Tests (dry and wet)

FREQUENCY OF THE SPECIMENS		
Rating	Dry	Wet
1	-	2
1.5	-	2
2	-	12
2.5	1	16
3	5	15
3.5	12	3
4	23	1
4.5	14	-
5	5	1
Total	60	60

Table 2: Analysis of Dry Rubbing Test

Fabric's Numbers	Scores
1, 5, 20, 24, 25	5
8, 11, 12, 14, 16, 17, 19, 22, 23, 26, 54, 55, 56, 58	4.5
2, 4, 6, 9, 10, 15, 21, 27, 28, 29, 30, 33, 40, 41, 42, 43, 45, 49, 50, 51, 52, 57, 59	4

3, 13, 18, 31, 32, 35, 37, 38, 44, 46, 48, 60	3.5
7, 34, 36, 39, 47	3
53	2.5

Key

1 = lowest point, fabric colourfast

1.5 – 4.5 = different degrees of colourfastness

5 = highest point, fabric not colourfast at all

Table 3: Analysis of Wet Rubbing Test

Fabric's Numbers	Scores
44, 48	1
3, 7, 9, 28, 30, 34, 35, 36, 39, 43, 47, 49	1.5
8, 13, 18, 27, 32, 37, 40, 41, 42, 45, 46, 51, 52, 53, 57, 59	2
4, 5, 6, 10, 14, 19, 21, 22, 24, 26, 29, 31, 33, 38, 50	2.5
11, 15, 17,20,23,25,54,55,56,60	3
12,16,58	3.5
1	4
2	5

Key

5 = lowest point, fabric colourfast

4.5-1.5 = different degrees of colourfastness

1 = highest point, fabric not colourfast at all

Analysis of the Ratings

The lowest and the highest points

It could be observed from table 2 that a greater number of the fabrics tested run less when tested dry except fabric number 53 that rated (2.5). This is the highest point of the dry test. The implication is that the colour of the fabric is not fast at all. It will rub on the body when worn. This particular fabric is the new type of alaari. On the other hand, fabric number 2 in Table 3 did not run at all when wet; it rated 5, which is the lowest point of the wet test. The implication is that the colour is very fast and will not run when wet or washed. The comparison of dry and wet showed that when wet, the color runs more or the stain is deeper than when dry.

The result of the rubbing test indicated that almost all the sixty alaari fabric tested were not colour fast. This has disproved the belief of some of the alaari users that old alaari types are better in fastness property than the new types. Hence there should be no relationship between the worth (economic value) of an alaari fabrics and the colour of the fabrics. The Ondo-Yoruba preferred the old alaari fabrics to the new one for a number of reasons:

- a. They have been washed several times over the year, which has made the fabrics more colour fast than new types
- b. Their yarns were hand spun
- c. The alaari stripes were sewn together manually.

They believe such skills can no longer be found hence they need to treasure and preserve the ones they have.

Textile properties

(a) The Yarn/texture: Twenty-three alaari fabrics out of the sixty examined show that they were woven and sewn together with hand spun yarns. They were rated as not less than fifty years in age (see Table 4 and 5). Twenty-three fabrics out of the sixty selected are very old types and their yarns were hand spun characterized by thickness and roughness of texture in hand. This quality has perhaps made possible the re-use and other social innovations done to old alaari fabrics because the thicker or heavier a woven fabric is, the longer the life span. The remaining thirty-seven pieces were made of machine spun yarns and their likely ages between three and forty-nine years (see Table 3 and 4). They were thinner when felt and smoother in appearance when compared with the hand spun types.

Table 4: Categorization of Fabrics' yarns

Source of Spun	Texture	Frequency
Hand spun	Rough/Thick	23
Machine spun	Smooth/Thin	37
Total		60

Table 5: Likely Ages of Selected Fabrics in years

LIKELY AGES OF FABRICS (IN YEARS)	FREQUENCY
1-20	20
21-49	17
50 and above	23
Total	60

(b) Dye: The worth of an alaari fabric is also determined by the quality of the dye used. From the analysis of the rating of the sixty selected alaari fabrics used for the two rubbing tests (dry and wet), only fabric number 2 which falls in category three of Table 4 (fifty years and above) did not run at all when wet. The rating was very low in the wet test. The implication is that the colour (dye) is very fast and will not run when the fabric is wet or washed. (All others in the three categories were not colour fast). The user preserves the colour of the alaari fabric by re-painting the faded ones with imported crimson-red colour called aro alaari through the help of the refurbishers. All in all, this shows that a large number of alaari used in Ondo were not colour fast. Consequently, the bled colour of the sample of the fabrics was tested for its dye classification. It was discovered that aniline basic and direct dyes (Petro-chemical dyes) were prominently used for dyeing the selected samples. The use of aniline basic and direct dye stuff dated back to 1856 and it revolutionalized the entire Nigerian dyeing industry (Keyes 1993) in the 1850s.

Barth noted “that these European dyes were frequently sold in the markets of Hausa land” (Shea 1974-77). By the 1930 in Southern part of Nigeria, the use was wide spread even in small towns, (Keyes 1993). Murray condemned this dye stuff thus: “the standard of the cloth made is often lowered nowadays by the use of cheap and ugly imported dyes” (Murray 1936). The achievements and availability enabled many dyers including the alaari producers adopt its use up till the

contemporary times. According to Keyes, the best of these basic and direct dyes produced rather low fastness and a proportion of those marketed in Nigeria were of particularly low quality (Keyes 1993). Hence, they had to be refurbished from time to time in order not to lose their brightness. The following analysis of the rubbing tests which is in percentage supports this fact.

Dry

1.7% scored 2.5, 8.3% scored 3, 20.0% scored 3.5, 38.3% scored 4.5 while the remaining 8.3% scored 5.

Wet

3.3% scored 1, 20.0% scored 1.5, 26.7% scored 2, 25.0% scored 2.5, 16.7% scored 3, 5.0% scored 3.5, 1.7% scored 4 while 1.7% also scored 5

Result and conclusion

The results of the rubbing test on the sixty selected alaari fabrics disproved the belief that the older alaari types have better color-fastness properties than the new types. Therefore, there should be no relationship between the worth (economic value) of an alaari fabric and its poor color. The dye used has always been a basic dye known for its poor color quality. It can also be concluded that the age of an alaari fabric has no bearing on its color-fastness. The color-fastness is a factor in why alaari fabrics are not washed regularly; if washed frequently, there is a tendency for much of the crimson red color to disappear.

In conclusion, those alaari fabrics that have already lost their brightness must be repainted periodically to maintain their vibrancy. The repainting is done by refurbishers, who are mostly women. They revealed that the process of refurbishing alaari fabrics has remained the same over the years, and they repaint the fabrics using red dyestuff.

Recommendations

1. The government should endeavour to better equip the five existing Technical Schools in the state especially the textile section
2. Textiles students should be exposed to colour chemistry so that after graduation, they will not only be skilled weavers but also good colour chemist.
3. Remedial courses or evening classes should be organized for existing weavers within Ondo community where they would be taught some basic courses in colour chemistry. The expected acquired knowledge from these basic courses will definitely be useful to the alaari weavers in

solving problems relating to colour-fastness. All these should be geared towards production of colorfast alaari fabrics.

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