

## PalArch's Journal of Archaeology of Egypt / Egyptology

### THE DEVELOPMENT OF NATURAL DYED FABRIC PRODUCT WITH SHIBORI FABRIC DYEING TECHNIQUE

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**Nuttida Pujeeb. The Development Of Natural Dyed Fabric Product With Shibori Fabric Dyeing Technique-- Palarch's Journal Of Archaeology Of Egypt/Egyptology 17(4), 1123-1133. ISSN 1567-214x.**

**Keywords: Product; Natural Tie-Dyed Cotton; Shibori**

#### **ABSTRACT**

This research on the development of natural dyed fabric products with Shibori fabric dyeing technique 1) studied concepts and processes of the Thai natural dyed fabric products 2) studied concepts and processes of the Shibori fabric dyeing technique from Japan and 3) developed the Shibori fabric dyeing technique by using the research methodology and development to study in-depth knowledge from resources in which the findings were used to develop new products. The researcher divided the research methodology into 4 phases. It was found that 1) cultural conservation, creation and development along with benefits of the Thai natural dyed fabric products could be divided into 2 models including cold dye and hot dye where each uses different natural products and processes depending on the availability of local resources and the knowledge passed on from generation to generation. The strength of Thai natural dyed fabric products is a variety of natural materials of colors. The weaknesses are the inability to create definite patterns and the lack of data as well as development to meet the standard. 2) cultural conservation, creation and development as well as benefits of the Shibori fabric dyeing technique, this dye folding from Japan is with the identity that prescribes the patterns on the fabrics by folding and sowing it. This is a well-established technique. 3) the Shibori natural fabric dyeing technique that the researcher invented used natural colors in Thailand combined with the folding technique from Japan resulting beautiful patterns and setting the standard with various bright colors.

#### **INTRODUCTION**

Colors are important in textiles whether they be at the industrial or local levels. This is because they result in the satisfaction of consumers from their first impression prior to purchasing. Colors are also the factor for repetitive purchases or not depending on the satisfaction with the quality and durability of the colors. This means the sale figures of any given products. Thus, textile dyeing has significant impact upon the market of such products. Other than the

importance of textile dyeing as well as its economic impact upon production, textile dyeing is also important in terms of color production processes and the chemical substances for dyeing. This extends to the treatment of water after the dyeing processes. All of these processes should be environmentally friendly (Kasembunyakorn, 2012). From chemical dyeing, which generated tang, caused nose irritation, dizziness and poisoning resulting in the inability to continue dyeing. This led to a housewife group returning to natural fabric dyeing because the colors are natural and pure, non-toxic to humans and non-harmful to humans. This can create unique fabrics that shine when weaving, leave no color stain. However, the processes are difficult and chaotic, which require skills, patience and experience in each dye to create the same colors (Datong, 2016).

The knowledge in relation to the art of fabric dyeing from natural materials is not a strange one nor is it a newly discovered innovation. However, such knowledge and its wisdom have been passed on from generation to generation. The tie dye folding technique that creates patterns on the fabric has been seen through history of each nation in almost every part of the world. It was first seen in the ancient Asian era, which expanded to Central Asia, Africa and Americas. The tie dye folding technique is tying, folding, sewing, or clipping a part of the fabric that the dyer does not want any color on it. It is done by using a coin, a hemp rope, a straw rope, a thread or a plastic bag as the material to curl, fold, plait, squeeze, or sow which the results of the patterns will vary depending on the method of color design and integration of techniques on the part of the dyer. The art of tie dye folding which has been passed on to people in a number of countries is called Plangi. It originated in Central Asia. After that it spread to Japan and India by merchants who travelled around Asia. In India, it is called "Banthana" which means tying or folding whereas in Japan it is called "Shibori", which means tying or knotting. Dye folding in each country varies in terms of pattern designs and color characteristics. This depends on the knowledge, wisdom and raw materials which are in accordance with the history and cultural dimensions of each local area (Saitong, 2001).

Natural fabric tie dye is a natural dye on the fabrics, which is knowledge and local wisdom that have been passed on from generation to generation. It is also a tradition and culture according to the community such as the tie dye of *Strobilanthes* by the residents of Thung Hong, Prachin province, the dye of natural colors by the residents of Khiriwong, Nakhon Sri Thammarat province and so on. Natural dye is a process of utilizing nature by relying on natural materials. This makes the dyers see the value and feel close to the nature. Using natural materials also contributes to conservation of trees and promotes more reforestation in order to add factors or raw materials to be used in natural dye. The products of natural dye fabrics have gone through development and attempt to study local wisdom for using leftover materials in the community to adapt and add value. This is done by transforming the materials to be shirts, shorts, skirts, cloth, handkerchiefs, bags, and so on. For Thai people, the products from natural dye is deemed old-fashioned handicraft and uninteresting among new generations. It may be because the

characteristics of the patterns of the Thai tie dyed fabrics are not attractive to new generations.

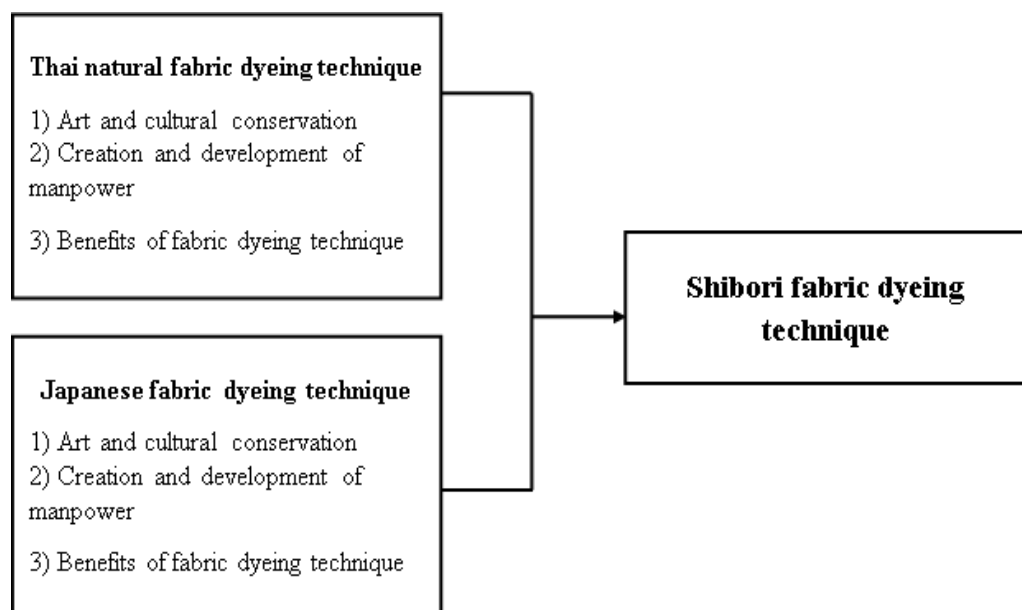
Therefore, tie dye products should be developed to be new and unique by applying concepts and other methods to create patterns that differ from the past. The development processes should also allow the production of the same interesting and modern standardized patterns. According to the teaching management of the researcher in relation to tie dye products, it was found that the Shibori fabric dyeing technique from Arimatsu, Nagoya province, Japan, which was popular in 1608 because of its smart ancient method that took an extended period of time to create complicated; yet, well-organized and beautiful patterns. They were the products of high quality that received compliments from all around the world. The development of natural Shibori fabric dyeing technique is considered development of knowledge in relation to the fabric dyeing technique in Thailand that applies the more complicated pattern creation technique. Not only does it upgrade the fabric dyeing products to be diverse, modern and responsive to the needs of new generations, but it also improves the teaching management about fabric dyeing techniques to be interesting and encouraging students to see the value of creating new fabric dyeing innovations.

### RESEARCH OBJECTIVES

The development of natural dyed fabric products with Shibori fabric dyeing technique has the following objectives:

1. Study the concepts and processes of the natural fabric dyeing techniques in Thailand;
2. Study the concepts and process of the Shibori fabric dyeing techniques of Japan; and,
3. Develop the technique for natural fabric dyeing based on the Shibori technique.

### CONCEPTUAL FRAMEWORK



## **RESEARCH METHODOLOGY**

This project is research and development using the qualitative research method to study and collect in-depth data through a case study in order to seek findings for creating and developing fabric dyed products with standard and quality. This research covered the period of 12 months during October 2019 to September 2020. The details are as follows:

### ***Phase 1: Study of art and cultural conservation, creation and development, and benefits of Thai natural fabric dyes***

This phase focused on collecting qualitative data through selection of purposive sampling to use as research data. The criteria for selection were as follows: 1) being a resource center of the natural fabric dye technique; 2) being a resource for not less than 10 years; 3) being a resource center that promote career practice activities, exchange of ideas and experience in the natural fabric dyeing technique; 4) being a resource hub of knowledge, public relations or information dissemination for local residents; and 5) being a center that promote other activities such as a shop front for local products, a point for gathering products, an area of gathering housewife activities and so on. In addition to these criteria, 2 resource centers for the Thai natural fabric dyeing technique were selected including 1) natural fabric dyeing group, Khiriwong, Lansaka, Nakhon Sri Thammarat and 2) famer wife group, Ban Tham Tao, Akat Amnuai, Sakhon Nakhon. Informants of each resource center were specified including chairperson/group head whose role was founding the resource center, and expert/experienced individual who has experience in fabric dye at the resource center. The data were collected against the following agenda: art and cultural conservation 2) creation and development and 3) benefits of Thai natural fabric dyes.

### ***Phase 2: study of art and cultural conservation, creation and development, and benefits of the Japanese Shibori fabric dyeing technique***

The qualitative data were collected by studying 15 documents and information from libraries and online sources against the following agenda: 1) art and cultural conservation; 2) creation and development; and 3) benefits of the Shibori fabric dyeing technique through literature and information about its basic knowledge and origin as well the Shibori fabric dyeing technique at Arimutsu, Nagoya, Japan.

### ***Phase 3: Comparative analysis of art and cultural conservation, creation and development, and benefits of the Thai natural fabric dyes and the Japanese Shibori fabric dyeing technique***

The findings in Phase 1 and Phase 2 were analyzed in order to look for similarities and differences in 3 dimensions including 1) art and cultural conservation; 2) creation and development; and 3) benefits of the fabric dyeing technique. The findings fell completely in the scope of the knowledge around science and arts.

#### ***Phase 4: developing techniques based on the Shibori fabric dyeing technique***

The findings in Phase 3 were used to compare the art and cultural conservation, creation and development, and the benefits of the Thai natural fabric dyes with the Japanese Shibori fabric dyeing technique. The results were analyzed to find a guideline to conserve art and culture as well as to develop local wisdom for the fabric dyeing technique.

#### **RESEARCH INSTRUMENTS**

Structured interviews and records of field work; summary and data analysis based on documents; and comparative analysis of the research findings

#### ***Data analysis procedure***

Content Analysis

#### ***Summary of research findings***

The research was divided into 4 phases as follows:

#### ***Phase 1: Phase 1: Study of art and cultural conservation, creation and development, and benefits of Thai natural fabric dyes***

Art and cultural conservation of Thai natural fabric dyes is divided into 2 types including:

#### ***Type 1***

In the initial stage of fabric dyeing technique, the characteristics of art and cultural conservation were in the form of passing on knowledge and practices from generation to generation. This was considered the knowledge to make for use and for sale of a family. It resulted in some body of knowledge missing because there were no heirs.

#### ***Type 2***

Later, there had been an upgrade of the fabric dye from being family products to community products. This resulted in the conservation of the fabric dyeing technique from knowledge to practices by local wise men or leaders of a community to members of the community or any individuals in the community who were interested. The knowledge and practices covered marketing and consumer needs as well.

#### ***Creation and development of Thai natural fabric dyes***

The creation of the Thai natural fabric dyes varied in creativity and available local natural materials. However, the problem was written knowledge and standardized processes such as ratio for mixing natural materials, number of

days for boiling natural materials. Practitioners relied on the way they were used to doing or what other people had told them.

The field work to study the Thai natural fabric dyes at the 2 resource centers aimed to collect data about the creation of colors from natural materials available in Thailand. It was concluded that there hot dye or cold dye techniques.

#### ***Hot dye technique (boiling to extract colors)***

Red comes from noni root, caesalpinia sappan, terminalia chebula peel and lac. Blue comes from true indigo. Yellow comes from cores of jackfruit, mulberry, turmeric, and Mexican marigold. Light green comes from pomegranate peel, true indigo, Indian-almond leaf, Terminalia bellirica peel and fruit, Acacia concinna leaf, turmeric powder, vegetable hummingbird leaf, and young pineapple leaf. Black comes from Diospyros mollis fruit, krajak fruit, terminalia peel and fruit. Orange comes from noni peel and root, and night-flowering jasmine (the orange tube). Yellow-orange comes from safflower oil. Purple comes from Java plum. Pink comes from caesal pinia sappan. Brown comes from mangrove peel, and mangosteen peel. Green comes from velvet apple, Indian-almond leaf and terminalia chebula peel.

#### ***Cold dye technique (fertilizing to create colors)***

Blue comes from true indigo. Burnt brown comes from red lotus stem. Red comes from Biancaea sappan leaf. Green comes from lotus leaf. And Blue comes from Tillacora triandra leaf.

The problem encountered was development of products from the Thai natural fabric dyeing technique was slow. This was because it started off as products of domestic use, which resulted in dyed fabrics being old-fashioned products and less valuable. In addition, the community residents lacked an agency or organization with knowledge to help and upgrade the products at the international level.

#### ***Benefits of the Thai natural fabric dyes***

The Thai natural fabric dyes generate income for families and communities. The benefits also create harmony among residents and their community.

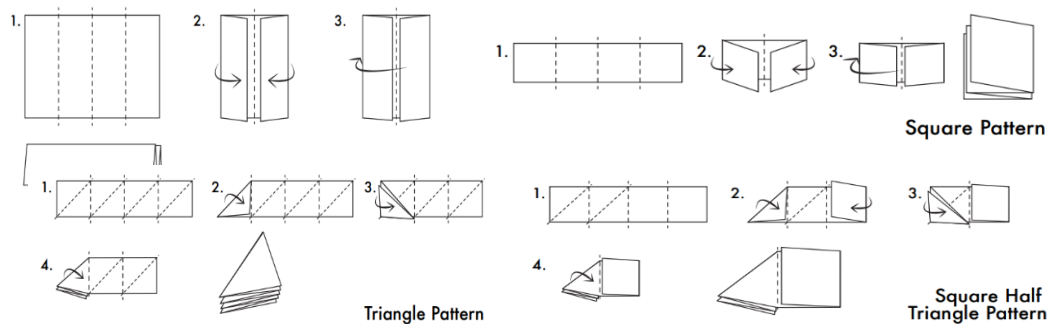
#### ***Phase 2: study of art and cultural conservation, creation and development, and benefits of the Japanese Shibori fabric dyeing technique***

##### ***Art and cultural conservation of the Japanese Shibori fabric dyeing technique***

The conservation of the Japanese Shibori fabric dyeing technique is done by means of passing on knowledge and practices from family members and community residents of generation to generation. It is considered important knowledge of the family and the community.

##### ***Creation and development of the Japanese Shibori fabric dyeing technique***

The creation of the Japanese Shibori fabric dyeing technique is divided into 2 types: 1) creation of the same patterns and colors so they are unique to the community. 2) creation of contemporary work to respond to the needs of consumers and community residents. This is done through collecting data based on the Japanese Shibori fabric dyeing technique as found in written relevant documents. This aimed to study the tying methods that were able to control the patterns which differed from the Thai fabric dyeing technique. The tying results can be summarized as following figure:



**Figure 1:** Researcher-selected Shibori fabric dyeing technique

### ***Phase 3: Comparative analysis of art and cultural conservation,***

#### ***creation and development, and benefits of the Thai natural fabric dyes and the Japanese Shibori fabric dyeing technique***

The comparative analysis between the art and cultural conservation, creation and development, and benefits of the Thai natural fabric dyes demonstrated the findings as follows:

#### ***Art and cultural conservation of the Thai natural fabric dyes and the Japanese Shibori fabric dyeing technique***

The art and cultural conservation of the Thai natural fabric dyeing technique and the Japanese Shibori fabric dyeing technique were similar. Each started from domestic use and expanded to business. The art and cultural conservation of the Thai natural fabric dyes and the Japanese Shibori fabric dyeing technique focused on passing on the knowledge and practices to family members from generation to generation. When the society has changed and technology has become modernized, local residents or individuals who were interested have formed a group to build power in terms of trade negotiation.

#### ***Creation and development of the Thai natural fabric dyes and the Japanese Shibori fabric dyeing technique.***

Creation of products from the Thai natural fabric dyes and the Japanese Shibori fabric dyeing technique was similar especially in terms of the origins of the patterns from nature. The dyeing methods were divided into hot dye and

cold dye. However, they differed in terms of the production processes as follows:

- 1) steps and details of folding to control patterns of Japan.
- 2) Organization of data or record of knowledge of fabric dye. The Japanese Shibori fabric dyeing technique has been recorded in its details in a systematic manner. However, the Thai natural fabric dyes relied on experience and expertise of production.

***Benefits of the Thai natural fabric dyes and the Japanese Shibori fabric dyeing technique***

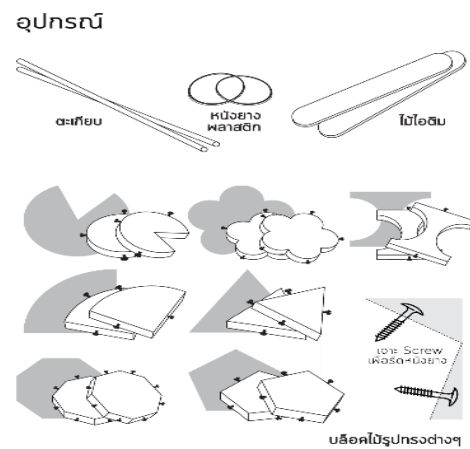
The direct benefits of the Thai natural fabric dyes and the Japanese Shibori fabric dyeing technique are similar. They are both for domestic use and business. The indirect benefits for Thailand are the creation of community networking which is more tangible than the Japanese counterpart.

***Phase 4: Developing techniques based on the Shibori fabric dyeing technique***

The findings of each step were used in the tie dye fabric. This was done through the tying technique of the Shibori model combined with the color partition technique designed by the researcher. After that, the fabric was dyed using local natural materials. The researcher created 6 patterns from the fabric dyeing technique as follows:

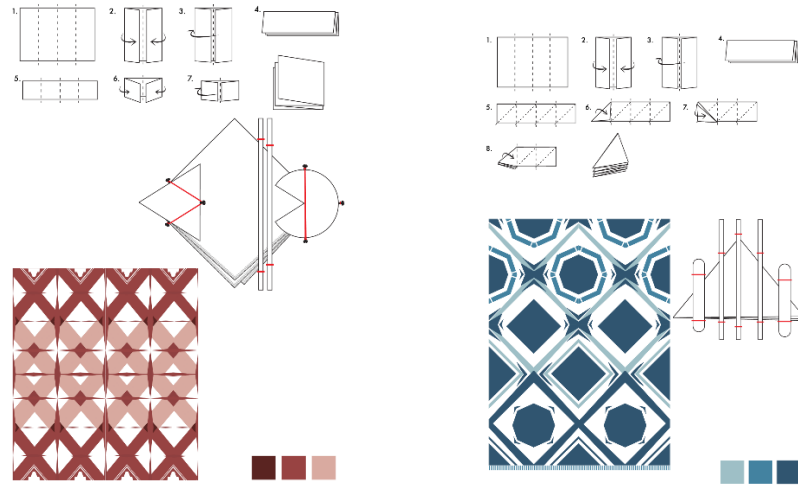


**Figure 2:** Natural colors used with the Shibori fabric dyeing technique

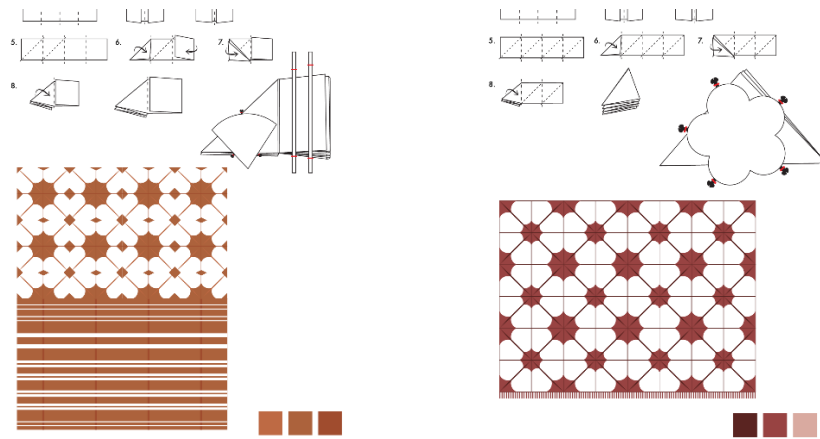


**Figure 3:** Wooden partition used with the Shibori fabric dyeing technique

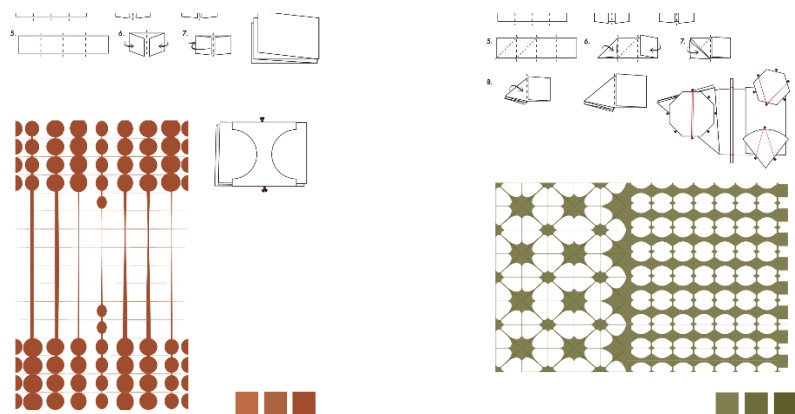




**Figures 4 and 5:** Fabric dyeing processes and examples of fabric patterns 1 and 2



**Figures 6 and 7:** Fabric dyeing processes and examples of fabric patterns 3 and 4



**Figures 8 and 9:** Fabric dyeing processes and examples of fabric

The findings indicated that the fabric dyeing processes and the art and cultural conservation of the Thai natural fabric dyes and the Japanese Shibori fabric dyeing technique were similar. For example, the similarity in their origins of the patterns which came from nature. The methods of dye were divided into hot dye and cold dye. The conservation of the fabric dyeing technique focused on passing on knowledge and practices to family members from generation to generation. This is in line with the research findings related to history in which the origin of the fabric dyeing technique came from Central Asia. Later, it spread to Japan and India by the hands of travelling groups and merchants who travelled for businesses around Asia. The art of fabric dyeing in India is called “Banthana”, which means to tie or to fold. In Japan, it is called “Shibori”, which means to tie or to knot (Saitong, 2001). In relation to the differences of art and cultural conservation, the Thai natural fabric dyes and the Japanese Shibori fabric dyeing technique used different natural materials. According to history of fabric dye in each country, there have been differences in terms of pattern design and use of colors. This depends on the knowledge, wisdom and materials as per the national history and culture of each community (Saitong, 2001).

The outcome of the development of the Shibori fabric dyeing technique by using natural colors and tying techniques along with the use of wooden partitions to design the 6 patterns of tie dyed fabrics was deemed to be the understanding of the processes of fabric dyeing technique in which there has to be a specified area on the fabric to create beautiful patterns. This concept is in line with Kanchana (2000) who wrote about the main principle of research in fabric dyeing technique entitled Design of Handmade Patterns Using Natural Tie Dyes. The main principle was the tied part was the part that did not want colors. The rest or the untied parts wanted to have colors. It was a method of stopping the colors from attaching.

## **RECOMMENDATION**

### ***Recommendation for application of research findings***

1. The findings of Shibori fabric dyeing technique differed from other pattern creations. Interested individuals, scholars, fabric dyeing pattern designers could use this method to create different fabric patterns.
2. Agencies, organizations and interested individuals may use the research findings as basic knowledge for creating fabric products or develop product quality to extend and upgrade their businesses through natural fabric dyeing technique and pattern creation of this research.

### ***Recommendation for future research***

There should be a study on application of the results and production and development processes in order to be a model for the development of other products. This should contribute to new innovations for Thailand.

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