



**UNIVERSITI TEKNOLOGI MARA**

**A STUDY ON FISH SCALES AND ITS  
SYSTEMATIC APPROACH ON  
COLOURING PROCESS**

**RUSMAWATI BT. GHAZALI**

Design Report submitted in partial fulfillment of the  
requirements for the Master Degree of  
**Design Technology (AD 774)**  
**Faculty of Art & Design**

April 2007

Accepted by the Faculty of Art and Design, University  
Technology MARA, in partial fulfilment for the Master Degree  
of Design Technology.

.....

**PROF. MADYA MOHAINEE HJ.KHALID**

Supervisor / Studio Project Advisor

Faculty of Art & Design, UiTM

.....

**ASSOCIATE PROFESSOR DR. BAHARUDDIN UJANG**

Dean Faculty of Art & Design, UiTM

.....

**PROF. DR. MUSTAFFA HALABI HJ. AZAHARI**

Head of Programme Post Graduate Studies

Faculty of Art & Design, UiTM

## ACKNOWLEDGEMENTS

Alhamdulillah. In searching and seeking for the best solution for this thesis, I faced many great challenges. To Allah the Al-Mighty, thanks for Your right guidance and wondrous opportunity. To understand the substance, we have to understand the matter. The success in completing this thesis is not done by me alone.

My deepest gratitude goes to Universiti Teknologi MARA, for the cost born for this endeavour through the Staff Scholarship. Not forgetting, Assoc. Prof. Dr. Baharudin Ujang, the Dean of the Faculty of Art and Design, and Assoc. Prof. Dr. Mustaffa Halabi Hj. Azahari the Coordinator of Masters Degree Programme who have given me the opportunity to study at this level. Heartfelt thanks to Prof. Madya Mohainee Hj.Khalid and Prof.Dr Hj.Muhamad Tamyez Hj. Bajuri for providing useful advice and guidance from the very first step I took.

Furthermore, I would like to extend out particular thanks to East Coast Textile Sdn. Bhd. (Chowdry Textile) for the support and encouragement throughout the course of the research. In connection with the gathered data in interview session, my special thanks to Pn. Basitah Taif , Dr. Norwani Hj.Nawawi and Hj. Zahari Ab. Rahman, Branch Manager at Kemubu Agriculture Development Authority.

I am also indebted to Ismaniza and Zaemah for their valuable assistance in the preparation of this thesis. To the people behind the scene; Irma Murni , Nur Sazayiana Haryiani , Affendi and Khairul Zikri ,thanks for the fantastic friendship and assistance.

A heartfelt thanks to my beloved husband, Syed Muhammad Sherazi , our lovely children; Syed Luqman Sherazi and Syed Azlan Sherazi and mother, Aishah, brothers and sisters in giving me love, never ending support and understanding to make this thesis a reality.

Last but not least, I would like to express my thanks to the many individuals and organizations involved directly and indirectly in the completion of this thesis.

## ABSTRACT

This research has been initiated to assist the fish scales entrepreneur in Malaysia into getting a consistent fish scales dye process. Several tests on colouring dyes have been conducted to establish a suitable dye with consistent measuring techniques.

With the above objectives in mind, the researcher hoped to establish a colour guideline in form of colour tones thus provides a wider choice of colour selection to these entrepreneurs.

John Snapper or Golden Snapper “Jenahak” from (*Lutjanus johni family*), Malabar Red Snapper “Merah” from (*Lutjanus malabaricus family*), Threadfish Bream “Kerisi” from (*Nemipteridae family*) and Herring or Toli Shad “Terubok” from (*Clupeidae family*) were the four types of salt water fish selected for their scales for this research as they are the most caught by Malaysian fishermen.

In the early stage of this experiment the researcher tried to find a suitable cleaning substance and process to wash these fish scales. Three types of cleaning agent were then tested such as detergent, lime juice and bleach. Of the three, lime juice produced the best result.

Some other experiments conducted were the crushing test, burning test, pounding test and baking test. They are to determine the durability quality of these fish scales.

The fish scales were then tested for colouring suitability. Five different types of fabric dyes were selected such as disperse dye, reactive dye, vat dye, pigment dye and natural dye. Out of these five types, Cool Reactive dye from Remazol brand gave the best colour reaction on these scales. The weighing technique was then established using grams for colours and litre for measuring water. Prior to this the researcher had used a spoon for measuring the colour quantity and cups for measuring the amount of water where it produced an inconsistent colour tones. Based on the colour tones obtained from the experiments, the researcher were able to establish an array of colours in the form of colour codes.

A colour fastness test were conducted on these coloured scales using test methods such as rubbing test, daylight test and soaking in sulphuric acid.

Apart from the above discoveries, the researcher was also able to find other valuable information to be shared with. They include the size, shape, thickness and texture of the scales which were different for all the four types of fish. The resilient characteristic of the scales made it difficult to tear or crushed. However, the colour absorption on these fish scales is being influenced by its thickness.

As for the recommendation, this research can be used as reference for producing wider range of handicraft products and products in form of jewellery or sequins. The colours can further be experimented using natural dye on other types of salt water or fresh water fish. Batik decoration techniques can be applied on a bigger size fish scales.