UNIVERSITI TEKNOLOGI MARA

MICROWAVE-BASED TECHNIQUES FOR RAPID AND FEASIBLE EXTRACTION OF JACKFRUIT LEAVES (*ARTOCARPUS HETEROPHYLLUS LAM*) ON THE SILK FIBRE

NURUL AIN BINTI ALI

MA

November 2021

AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

Name of Student	:	Nurul Ain Binti Ali
Student I.D. No.	:	2016597435
Programme	:	Master (Arts & Design)– AD750
Faculty	:	Faculty of Art &Design
Thesis Title	:	Microwave-Based Techniques For Rapid And Feasible Extraction Of Jackfruit Leaves (Artocarpus Heterophyllus Lam) On The Silk Fibre.
Signature of Student	:	
Date	:	November 2021

ABSTRACT

The dyeing of traditional textiles by the Malay craftsman in Malaysia in the past is related to natural dyes. Resources obtained from the jackfruit is one of t h e potential colouration. Jackfruit leaves (*Artocarpus Heterophyllus Lam Leaves*) are a renewable source which is often removed from the tree. In this research, three categories of jackfruit leaves were used as the main material; the *Young Leaves* (YL), *Medium Leaves* (ML) and *Old Leaves* (OL). The experimental method with a *Two Group Pretest-Treatment-Posttest Design* was applied to manipulate the variables in achieving the results. The procedures were divided into two stages; the *Pre-test Group* and the *Post-Test Group* of experiments. Extraction through microwave oven was prescribed in the three processes namely the *Pre-mordanting and dyeing*, *Simultaneous mordanting and dyeing* and *Post-mordanting and dyeing*. Aluminium sulphate and natural tannin from the leaves act as the mordant to bind the substrate. All samples were tested for their pH concentration. There were 36 liquid extract and silk yarn samples obtained from the Pe- Test and Post-Test experiments. Through visual observation, it was found that the colours of the liquid extract and fabric samples from the Old Leaves in the Post-Test showed excellent results with a range of deep brown colours. In contrast to the Young Leaves and Middle Leaves which appeared in the yellowish-brown shades. The pH values of the extract from *Post-Test* were read in the range 5 - 7 (acidic) as compared to the *Pre-Test* which were 9 – 10 (alkali). The overall shades for the woven piece of textile sample appeared almost the same between the extracts. Thus, the jackfruit leaves were able to extract a range of colours' based on appropriate leaves' categories and methodological approach.

Keywords: Jackfruit, Microwave Oven, Mordanting, Natural Dyes, Silk Yarn

ACKNOWLEDGEMENT

In the Name of Allah, the Most Merciful.

First and Foremost, I would like to express my utmost gratitude to ALLAH S.W.T., that by His grace, I have finally completed my research journey (Master of Art & Design).

My appreciation and million thanks go to my respected supervisor, Associate Professor Dr Basitah Taif. Without her, I could not afford to stand here to learn and understand about the experimental research. She did his marvellous part by frequently encouraging and guiding me along my study and also to my Master Research programme coordinator Associate Professor Ts Rosita Mohd Tajuddin who has always advised me regarding the studies disciplines.

Special thank go to my beloved parents Ali Ismail, and Mek Wok Awang Chik and my siblings for their unconditional support, kindness, patience and keeping me in their prayer have kept me motivated throughout this journey.

Many thank also to my fellow researcher and friend. Also, to all of IPSis Associate Professor who have shared their research skills, knowledge and guidance in the IPSis seminars.

Not forgetting to IPSis UiTM and Post Graduate Studies of Faculty Art and Design UiTM for giving me the opportunity to join International Academic Conference in Creative Industry and Art (IACIAC 2020) under Langkawi International Multidisciplinary Conference 2020 (2nd LIMC 2020) and financial support (Geran Insentif Penyelia) for my study.

Lastly, thank you to everyone who inspired me to strive and become what I intended to be and involved in helping me to gather the information for my dissertation also share moments of joy and tears, InsyaAllah with Allah blessing, this journey will come to an end.

Alhamdulillah…

TABLE OF CONTENTS