

# **INHIBITION EFFECT OF CARICA PAPAYA (PAPAYA) LEAVES EXTRACTS ON SS400 MILD STEEL IN SEAWATER**

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**COLLEGE OF MARITIME STUDIES AND SCIENCE MARINE  
UNIVERSITY MALAYSIA TERENGGANU  
2013**

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## Inhibition effect of carica papaya (pawpaw) leaves extracts on ss400 mild steel in seawater / Mohd DhiyaulRahman Mesni.



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ON SS400 MILD STEEL IN SEAWATER**

By

**Mohd DhiyaulRahman Bin Mesni**

**Research Report submitted in partial fulfillment of  
the requirement for the degree of  
Bachelor of Applied Science (Maritime Technology)**

**Department of Maritime Technology  
Faculty of Maritime Studies and Marine Science  
UNIVERSITI MALAYSIA TERENGGANU  
2013**



DEPARTMENT OF MARITIME TECHNOLOGY  
FACULTY OF MARITIME STUDIES AND MARINE SCIENCE  
UNIVERSITI MALAYSIA TERENGGANU

DECLARATION AND VERIFICATION REPORT  
FINAL YEAR RESEARCH PROJECT

It is hereby declared and verified that this research report entitled: **Inhibition Effect of Carica Papaya (Pawpaw) Leaves Extracts on SS400 Mild Steel in Seawater by Mohd Dhiyaulrahman bin Mesni, Matric No. UK 20625** have been examined and all errors identified have been corrected. This report is submitted to the Department of Maritime Technology as partial fulfillment towards obtaining the **Bachelor Degree of Applied Science (Maritime Technology)**, Faculty of Maritime Studies and Marine Science, Universiti Malaysia Terengganu.

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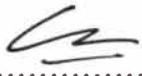
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## **DECLARATION**

I hereby declare that this thesis entitled **INHIBITION EFFECT OF CARICA PAPAYA (PAWPAW) LEAVES EXTRACTS ON SS400 MILD STEEL IN SEAWATER** is the result of my own research except as cited in the references.

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## **ACKNOWLEDGEMENTS**

I would like to thank all those people who made this thesis possible and an enjoyable experience for me. First and foremost, I would like to express my gratitude to my supervisor, Prof. Dr. Wan Mohd Norsani Wan Nik for the guidance given throughout the progress of this project. His guidance and supervision has enabled me to develop an understanding in approaching a research study and needs to be persistent to accomplish goals. Besides, it is also an honour for me to thank Encik Che Wan Bin Mohd Noor as my second supervisor and Dr. Ahmad Faisal Mohamad Ayob for their feedbacks and assistances with my research.

I'm grateful to all my friends and course mates for their encouragement and help. My friends had made available their full support in a number of ways. I'm grateful for their comments and continuous support. I'm also grateful to the Department of Maritime Technology and Maritime Technology laboratory, staff of physics laboratory, staff of the Oceanographic laboratory for their corporation, guidance and help in accomplishing my project and also not forget to villagers around the Mengabang Telipot villages by helping me to get the carica papaya leaves.

Finally, I would like to express my deepest gratitude for a constant support, and understanding that I received from my family especially to my beloved father, mother, brother and sister. Without their support, I would not have the commitment to complete my research successfully.

## INHIBITION EFFECT OF EXTRACTS OF CARICA PAPAYA (PAWPAW) LEAVES ON SS400 MILD STEEL IN SEAWATER

### ABSTRACT

The inhibitive effect of carica papaya leaves extracts on the corrosion of mild steel in seawater will be investigated. The study been carried out using the mild steel SS400 and carica papaya leaves extract as a corrosion inhibitor. The constituent of carica papaya leaves extracts showed that it has potential as inhibitors of SS400 mild steel corrosion in seawater and marine environment. The laboratory immersion test technique been used to study either carica papaya extracts is a good corrosion inhibitor in the weight loss method and electrochemical experiments. The components of carica papaya leaves extract were studied through fourier transform infrared spectroscopy (FTIR). Type of natural inhibitor, and inhibition efficiency were studied through Polarization Test and Impedance Test by electrochemical impedance spectroscopy (EIS). Based on the test that have been done, several objectives been achieve, that is the effect of carica papaya leaves extract for the inhibition of mild steel in seawater, the corrosion inhibition efficiency of the carica papaya leaves extract by using electrochemical impedance spectroscopy, the corrosion inhibition of carica papaya leaves extract inhibitor with respect to immersion period and get to identify the functional group in carica papaya leaves that help it to be good corrosion inhibitor.

**Keywords:** Carica Papaya Leaves Extracts, EIS, FTIR, Mild Steel (SS400), and Seawater

**KESAN ERENCATAN EKSTRAK DAUN BETIK PADA KELULI LEMBUT  
SS400 DALAM AIR LAUT**

**ABSTRAK**

Kesan perencatan ekstrak daun betik pada keluli lembut akan di kaji. Kajian ini dijalankan dengan menggunakan keluli lembut SS400 dan ekstrak daun betik. Kandungan ekstrak daun betik dikatakan mempunyai potensi untuk merencat pengaratan pada keluli lembut SS400 yang terdedah dengan air laut dan persekitaran marin. Teknik ujian rendaman digunakan bagi mengkaji sama ada ekstrak daun betik ini merupakan bahan perencat pengaratan yang baik dengan menggunakan kaedah pengurangan berat dan elektrokimia eksperimen. Komponen ekstrak daun betik ini di kaji dengan menggunakan spektroskopi inframerah transformasi fourier (FTIR). Jenis perencat semulajadi dan kecekapan perencatan dikaji dengan menggunakan kaedah ujian polarisasi dan ujian impedans melalui spektroskopi impedans elektrokimia (EIS). Berdasarkan ujian yang dijalankan beberapa objektif telah dicapai iaitu, kesan ekstrak daun betik terhadap proses perencatan pengaratan pada keluli lembut dalam air laut, kecekapan perencatan ekstrak daun betik dengan menggunakan spektroskopi impedans elektrokimia, hubungan antara perencatan pengaratan oleh perencat ekstrak daun betik dengan tempoh masa rendaman dan mampu mengenal pasti kumpulan fungsi yang terdapat pada daun betik yang membantu dalam menjadikan ia sebagai perencat pengaratan yang baik.

**Kata kunci:** Ekstrak Daun Betik, EIS, FTIR, Keluli Lembut (SS400), and Air Laut