

**MORPHOLOGICAL CHARACTERISTICS OF *Pinus radiata*,  
*Picea abies* AND *Pinus sylvestris***

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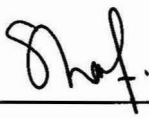
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## ABSTRACT

### MORPHOLOGICAL CHARACTERISTICS OF *Pinus radiata*, *Picea abies* AND *Pinus sylvestris*

The morphological characteristic of fiber can determine the properties and behavior of wood species as a raw material in production line. The softwood species from *Pinus radiata*, *Picea abies* and *Pinus sylvestris* has been widely used in pallet and furniture industry. All of these three pine wood were categorized under family of Pinaceae. However, there are lack of information and research study regarding the morphological characteristic of the wood. The main purposes of this study were to determine and compare the morphological characteristics of *Pinus radiata*, *Picea abies* and *Pinus sylvestris*. The wood sample was taken from CHEP (Malaysia) Sdn. Bhd. and the fiber maceration was conducted using sodium chlorite method. The experimental design was based on Randomized Block Design (RBD). The findings of the study show a highly significant different on the fiber diameter and lumen diameter while there is no significant evidence on the fiber length and cell wall thickness on the three soft wood species. In terms of felting power the *Pinus sylvestris*, *Pinus radiata* and *Picea abies* has good potential to be used in paper production, tissue and packaging material. Although, there are slightly concerned on the strength properties of *Pinus sylvestris* since the runkel ratio and flexibility ratio is not pass the standard value.

## TABLE OF CONTENTS

	<b>Page</b>
<b>APPROVAL SHEETS</b>	<b>i</b>
<b>CANDIDATE'S DECLARATION</b>	<b>ii</b>
<b>ACKNOWLEDGEMENT</b>	<b>iii</b>
<b>TABLE OF CONTENTS</b>	<b>iv</b>
<b>LIST OF TABLES</b>	<b>vi</b>
<b>LIST OF FIGURES</b>	<b>vii</b>
<b>LIST OF PLATES</b>	<b>viii</b>
<b>LIST OF ABBREVIATIONS</b>	<b>ix</b>
<b>ABSTRACT</b>	<b>x</b>
<b>ABSTRAK</b>	<b>xi</b>
<b>CHAPTER</b>	
<b>1 INTRODUCTION</b>	<b>1</b>
1.1 Background of Study	1
1.2 Problem Statement	3
1.3 Scope and Limitations	3
1.4 Justification of Study	3
1.5 Objectives of Study	4
<b>2 LITERATURE REVIEW</b>	<b>5</b>
2.1 Formation of Wood	5
2.2 Characteristics of Softwood Species	7
2.2.1 <i>Pinus radiata</i>	9
2.2.2 <i>Picea abies</i>	10
2.2.3 <i>Pinus sylvestris</i>	13
2.3 Morphological Characteristics	14
2.3.1 Fiber Length	17
2.3.2 Fiber Diameter	17
2.3.3 Lumen Diameter	18
2.3.4 Cell Wall Thickness	18
2.3.5 Runkel Ratio	19
2.3.6 Felting Power	20
2.3.7 Flexibility Coefficient	20

	2.4 Importance of Morphological Characteristics	21
<b>3</b>	<b>MATERIALS AND METHODS</b>	<b>22</b>
	3.1 Materials	22
	3.2 Fiber Maceration	22
	3.3 Fiber Morphology	23
	3.4 Design of Experiment (DOE)	27
<b>4</b>	<b>RESULTS AND DISCUSSIONS</b>	<b>29</b>
	4.1 Introduction	29
	4.2 Morphological Characteristics Analysis on <i>Picea abies</i> , <i>Pinus sylvestris</i> and <i>Pinus radiata</i>	29
	4.3 Statistical Analysis	30
	4.4 Effect of Morphological Characteristics Based on Species	31
	4.4.1 Fiber Length	32
	4.4.2 Fiber Diameter	32
	4.4.3 Lumen Diameter	33
	4.4.4 Cell Wall Thickness	34
	4.5 Felting Power, Runkel Ratio and Flexibility Ratio	35
<b>5</b>	<b>CONCLUSIONS AND RECOMMENDATIONS</b>	<b>39</b>
	5.1 Conclusions	39
	5.2 Recommendations	40
	<b>REFERENCES</b>	<b>42</b>
	<b>EVALUATION OF FINAL YEAR PROJECT REPORT</b>	
	<b>PUBLICATION OF THE PROJECT REPORT UNDERTAKING</b>	
	<b>PERMISSION FOR REFERENCES AND PHOTOCOPYING</b>	
	<b>CURRICULUM VITAE</b>	