

**VARIATION IN FIBER MORPHOLOGY OF MAHANG GAJAH (*Macaranga
gigantea*)
ACCORDING TO SAPWOOD AND HEARTWOOD AND DIFFERENT HEIGHT
LEVELS**

**BY
NOR HASHILAH ABD HALIM**

**Final Project submitted in Partial Fulfillment for Diploma in Wood Industry
Faculty of Applied Sciences
Universiti Teknologi MARA Pahang**

NOV 2005

ACKNOWLEDGEMENT

Alhamdulillah, a very grateful to Allah because with His blessing, I'm successfully finishing my project paper.

I would like to express my appreciation to my advisor Prof. Dr, Suhaimi Muhammed for his encouragement, guidance and assistance in order to finish my project paper.

I also want to dedicate a special appreciation to my beloved one, Mohd Amirul Syahid. Thanks for your support and reliance on me, and thanks for giving me strength to keep up with this study.

Last but not least, thanks to all my friends, Angah, Along, Kak Red, Zill, Kak Ti, Yani, Keri, and my entire classmate. You all have been very nice friends in the world. You guys always bring joy in my day.

THANKS A LOT.....

TABLE OF CONTENT

APPROVAL SHEET	i
DEDICATION	ii
ACKNOWLEDGEMENT	iii
LIST OF TABLE	vi
LIST OF FIGURE	vii
LIST OF PLATE	viii
LIST OF ABBREVIATIONS	ix
ABSTRACT	x
ABSTRAK	xi

CHAPTER

1.0	INTRODUCTION	1
1.1	General	1
1.2	Objectives	3
2.0	LIYERATURE REVIEW	4
2.1	Characteristic of Mahang Gajah	4
2.2	Physical Properties Of Mahang Gajah	4
2.3	Wood Anatomy.....	5
2.4	Utilization	5
2.5	Importance of Fiber Morphology	5
2.5.1	Fiber length	5
2.5.2	Cell Wall Thickness	6
2.5.3	Runkle Ratio	6
2.5.4	Felting Power	6
2.5.5	Coefficient of Suppleness	6
3.0	MATERIAL AND METHOD	7
3.1	Raw Material Preparation	7
3.2	Fiber Maceration	9
3.3	Slide preparations	10
3.4	Microscopic Observation	11
4.0	RESULT AND DISCUSSION	12

4.1	Variations of Fiber Length	12
4.2	Variation in Cell Wall Thickness	14
4.3	Runkle Ratio	16
4.4	Felting Power	18
4.5	Coefficient of Suppleness	19
5.0	CONCLUSION	20
REFERENCES		21
APPENDICES		22
VITA		31

**FIBER MORPHOLOGY OF MAHANG GAJAH (*Macaranga gigantea*)
DIFFERENCES BETWEEN SAPWOOD AND HEARTWOOD ACCORDING
TO HEIGHT PORTION**

**BY
NOR HASHILAH ABD HALIM
NOV 2005**

ABSTRACT

The study of fiber morphology of Mahang Gajah are carried out based on TAPPI Standard. The objectives of this study is to determine the characteristic of fiber at different portion of tree. It is between sapwood and heartwood from three different height level; DBH, middle and top. Fiber length for sapwood at DBH level are longer(2.0023mm) and the less is from heartwood (1.5561mm) at top. The cell wall thicknesses of the fiber are between 7.671 μ m for sapwood and 7.4468 μ m for heartwood. Runkle ratio for Sapwood is between 0.9548 to 1.1001 meanwhile runkle ratio for heartwood is between 0.9282 to 0.9506. Felting power for sapwood is between 0.0574 to 0.0613. felting power for heartwood is between 0.0524 to 0.0563. The COS for sapwood is between 47.6161 to 51.4202. COS for heartwood is between 51.2667 to 51.8620.