

UNIVERSITI TEKNOLOGI MARA

**PEAT SOILS HUMIFICATION
DEGREE ANALYZED BY FESEM
EQUIPPED WITH ENERGY
DISPERSIVE XRAY TECHNIQUE AS
SUPPLEMENTAL FOR VON POST
SCALE METHOD**

IZZATUL AKMAL BINTI AZMI

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ABSTRACT

The humification process in peat soils involves the degradation of physical structure in organic matter and changes in chemical characteristics under aerobic and anaerobic conditions. To classify humification degree, the von Post Scale method is widely used by industries, researchers and students. However, this method often produces different results and interpretation due to different skills exhibit by individuals. This study hypothesized that there is a significant difference between physicochemical properties of peat soils in relation with different peat humification degree. The objectives of this study are to analyze the physicochemical properties of peat soils; to compare the humification degree between von Post Scale and FESEM-EDX technique, and to propose the basic humification classification technique for the Tasik Series. The peat samples with various degrees of decomposition were differentiate in the field using the von Post Scale method. Physical analyses were performed using the Munsell soil colour chart, core rings, oven-dried method, and syringe method to determine the soil colour, bulk density, moisture content, and fibre content, respectively. Soil chemical properties analyses conducted includes the soil pH in KCl and water, soil C/N ratio, soil exchangeable cations (Ca, Mg, and Na) and soil cation exchange capacity (CEC). The microstructural analysis was determined using FESEM, and the elemental analysis was derived using EDX. The results for physical analysis showed that the higher the peat humification degree, the peat soils become darker with increment in soil bulk density, lower soil water content as well as organic matter contents. On the other hand, the results of soil chemical analysis were inconsistent among samples. The data indicates that as peat soils' decomposition increases, the soil pH, nutrient availability, soil cation exchange capacity and soil exchangeable cations also increase whereas the soil C/N ratio showed a decreasing pattern. Owing to the FESEM analysis solely observed based on a minute scale, the characterization of basic humification degree was not able to be introduced due to the inconsistent and fluctuating results in microscopic, chemical, and elemental analysis. As such, bigger sample sizes are needed in the future to obtain better results.

Keywords: peat, humification degree, decomposition, microstructure, von Post Scale

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TABLE OF CONTENTS

	Page
CONFIRMATION BY PANEL OF EXAMINERS	ii
AUTHOR'S DECLARATION	iii
ABSTRACT	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENTS	vi
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF ABBREVIATIONS	xii
CHAPTER ONE INTRODUCTION	1
1.1 Research background	1
1.2 Problem statement	2
1.3 Research objectives	4
1.4 Research questions	4
1.5 Hypothesis	4
1.6 Significance of the study	4
1.7 Scope and limitation of the study	5
CHAPTER TWO LITERATURE REVIEW	6
2.1 Peat Soils	6
2.1.1 Distribution of peat soils in Malaysia	6
2.1.2 Peat soils layers	7
2.1.3 Classification of peat soils	9
2.2 Physicochemical properties of peat soils	12
2.2.1 Physical characteristics	12
2.2.2 Chemical characteristics	18
2.3 Humification of peat	22
2.3.1 Decomposition process in peat soils	22
2.3.2 Method of classification	23

2.4	Digimizer analysis	31
CHAPTER THREE RESEARCH METHODOLOGY		33
3.1	Preliminary study	33
3.2	The physicochemical properties of peat soils analyzed	34
3.2.1	Sampling location	34
3.2.2	Soil sampling and preparation	34
3.2.3	Soil physical analysis	36
3.2.4	Chemical analysis	38
3.3	Comparison of humification degree of peat soils using the von Post Scale and FESEM-EDX technique	40
3.3.1	Von Post Scale of Humification	40
3.3.2	FESEM-EDX	40
3.4	The basic humification classification technique proposed for selected tropical peat soils	40
3.4.1	Digimizer analysis	40
CHAPTER FOUR RESULTS AND DISCUSSION		42
4.1	Physicochemical properties of natural and pineapple cultivated peats	42
4.2	The physicochemical properties of peat soils (Tasik Series) analyzed	46
4.3	Comparison of humification degree of peat soils using the von Post Scale and FESEM-EDX technique	54
4.3.1	Comparison between von Post Scale and FESEM-EDX	54
4.4	The basic humification classification technique proposed for selected tropical peat soils	65
4.5	General findings	74
CHAPTER FIVE		76
5.1	Conclusion	76
5.2	Recommendations	77