

**INVESTIGATION OF MINERAL ( $\text{Ca}^{2+}$  AND  $\text{Mg}^{2+}$ ), TOTAL COLIFORM  
BACTERIA AND HEAVY METALS IN BOTTLED MALAYSIAN DRINKING  
AND MINERAL WATER**

**NUR ARMA ARIZA BT ALIAS**

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## TABLE OF CONTENTS

	<b>Page</b>
<b>ACKNOWLEDGEMENT</b>	iii
<b>TABLE OF CONTENTS</b>	iv
<b>LIST OF TABLES</b>	vi
<b>LIST OF FIGURES</b>	vii
<b>LIST OF ABBREVIATIONS</b>	viii
<b>ABSTRACT</b>	ix
<b>ABSTRAK</b>	x
<b>CHAPTER 1 INTRODUCTION</b>	
1.1 Background	1
1.2 Minerals (Ca <sup>2+</sup> and Mg <sup>2+</sup> )	4
1.3 Bacteria	5
1.4 Heavy Metals	7
1.5 Significance of Study	8
1.6 Objectives of Study	9
<b>CHAPTER 2 LITERATURE REVIEW</b>	
2.1 Minerals (Ca <sup>2+</sup> and Mg <sup>2+</sup> )	10
2.2 Bacteria	12
2.3 Heavy Metals	13
<b>CHAPTER 3 METHODOLOGY</b>	
3.1 Materials And Chemicals	15
3.2 Samples	15
3.3 Samples Frequency	16
3.4 Sample Analysis	16
3.5 Bacterial Analysis	17
<b>CHAPTER 4 RESULTS AND DISCUSSION</b>	
4.1 Results	19
4.2 Discussion	23
<b>CHAPTER 5 CONCLUSION AND RECOMMENDATION</b>	
5.1 Conclusion	35
5.2 Recommendation	36

## ABSTRACT

### **INVESTIGATION OF MINERAL ( $\text{Ca}^{2+}$ AND $\text{Mg}^{2+}$ ), TOTAL COLIFORMS BACTERIA AND HEAVY METALS IN BOTTLED DRINKING AND MINERAL WATER**

This study was conducted on six brands of Malaysian bottled mineral and drinking water. Three brands of mineral water (brand 1, brand 2, brand 3) and three brands of drinking water (brand 4, brand 5, and brand 6). The purpose of this study was to compare the concentration of  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  ions in both bottled drinking and mineral water, then to investigate the presence and quantity of the total coliforms bacteria in both bottled mineral and drinking water. Third, to identify and determine the concentration of heavy metals in both bottled mineral and drinking water and finally to compare minerals, total coliforms bacteria and heavy metals in both bottled drinking and mineral water with Malaysian Drinking Water Standards by Ministry of Health and Food Act 1983(ACT 281) & Regulations. The ICP-OES was used to detect heavy metals and the minerals,  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$ . Total coliforms bacteria analysis used membrane filtration method. Results shown only four of the six brands of both mineral and drinking water follow the National Standard For Drinking Water Quality and Food Act 1983(ACT 281) & Regulation.

# CHAPTER 1

## INTRODUCTION

### 1.1 Background

Drinking water gives a lot of benefits to our health. Water is important to the mechanics of human body. Without water, the body cannot work well. In fact, the whole cells and organs functions in our body are dependent on water.

Water makes up more than two thirds of the weight of the human body, and without water, humans would die in a few days. The human brain is made up of 95% water; blood is 83% and lungs 90%. Importance of water are as below:

- i. Water serves as a lubricant
- ii. Water forms the base for saliva
- iii. Water forms the fluids that surround the joints.
- iv. Regulates metabolism
- v. Regulates body temperature
- vi. Makes up 83% of blood
- vii. Removes waste
- viii. Composes 75% of brain
- ix. Helps carry nutrients and oxygen to cells
- x. Moistens oxygen for breathing
- xi. Helps convert food to energy