

**UNIVERSITI TEKNOLOGI MARA**

**PRESERVATIVES LEVEL (BENZOIC ACID)  
IN SELECTED FRUIT JUICES  
AND ITS POTENTIAL HEALTH RISK  
AT PUNCAK ALAM, KUALA SELANGOR**

**AISYAH HANI BINTI MOHD AZAMI**

**Project paper submitted in partial fulfilment of the requirements for the  
degree of**

**Bachelor of Environmental Health and Safety (Hons.)**

**Faculty of Health Sciences**

(AISYAH HANI BINTI MOHD AZAMI)

2013444894

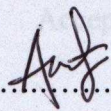
920215 - 01 - 5026

**JULY 2016**

## Declaration by Student

Project entitled “Preservatives Level; Benzoic Acid in Selected Brands of Fruit Juices at Puncak Alam, Kuala Selangor and Its Potential Health Risk” is a presentation of my original research work. Whenever contributions of others are involved, every effort is made to indicate this clearly, with due reference to literature, and acknowledgement of collaborative research and discussions. The project was done under the guidance of Project Supervisor Prof. Madya Rodziah Binti Ismail. It has been submitted to the Faculty of Health Sciences in partial fulfilment of the requirement for the Degree of Bachelor in Environmental Health and Safety (Hons).

Student’s Signature:

.....  .....

(AISYAH HANI BINTI MOHD AZAMI)

2013444894

920215 - 01 - 5026

Date: 25<sup>th</sup> July 2016 .....

## ACKNOWLEDEMENT

TITLE	PAGE
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv

Assalamualaikum and Alhamdulillah I praised to Allah S.W.T. the Most Gracious and Most Merciful for giving me passion, strength and health to complete my study. My greatest pleasure and salam to the great Prophet Muhammad S.A.W.

First and foremost, I would like to express my gratitude to my family members; my parents En. Mohd Azami Bin Othman and Pn. Hamidah Binti Ibrahim for giving birth of me and for the endless love and continuously giving support throughout my study.

My sincere thanks to my supervisor, Prof Madya Rodziah Binti Ismail, for the guidance along my study time and research journey. Having her as a supervisor and mentor is a great pleasure. Apart from that, thank you to all the lecturers from Environmental Health and Safety Department for teaching me and sharing their immense knowledge from the beginning of my study time till the end. Not forgotten, my sincere thanks goes to the laboratory staffs, En Aswad, En Shah, Pn Julei and Post – graduate senior, Ashikin for their helps with the equipment needed in my research.

Last but not least, I wish to convey my special appreciation to my friends especially, Zahirah Maisarah, Siti Nur Ruuhana, Nur Izzati and Atiqah Syahirah and others who directly or indirectly contributed to my study and always being with me. Alhamdulillah and May Allah bless all of you.

## CHAPTER 2: LITERATURE REVIEW TABLE OF CONTENTS

TITLE	PAGE
ACKNOWLEDGEMENT	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	v – viii
LIST OF FIGURES	ix
LIST OF PLATES	x
LIST OF APPENDICES	xi
LIST OF ABBREVIATION	xii
ABSTRACT	xiii - xiv

## CHAPTER 1: INTRODUCTION

1.1 Background Study	1 - 2
1.2 Problem Statement	3
1.3 Significance of Study	4
1.4 Objective	5
1.4.1 General Objective	
1.4.2 Specific Objective	
1.5 Scope of the study	6
1.6 Conceptual Framework	7
1.7 Hypotheses	8
1.8 Equipment	
1.9 Instrumentation	
1.10 Preparation of Sample	21

## ABSTRACT

Preservatives Level; Benzoic Acid in Selected Fruit Juices and Its Potential Health Risk

by

Aisyah Hani Binti Mohd Azami (2013444894)

Benzoic acid is one of the most commonly used food preservatives. In Malaysia, benzoic acid and its salts are permitted food additives by Malaysia legislation, Food Regulation 1985 in processing in restrictive amounts, but their content must be declared and must not exceed the established limits by legislation. The level of benzoic acid in different brands of fruit juices available on the markets, stores and grocery shop in Puncak Alam, Kuala Selangor were determined by high performance liquid chromatography with a UV detector. Chromatographic separation was achieved with Zorbax SB-C18 4.6 x 250mm 5-Micron column. The mobile phase used was methanol-acetate buffer (pH 4.4) (35:65, v/v), and 1.5 mL/min as the flow rate for the benzoic acid determination. The concentrations of benzoic acid in all the samples (fruit juices) were calculated by external standard method with a calibration of correlation coefficient of 0.9980 and 0.9933 respectively from the standards calibration curves. The range of concentrations was from 212.9 mg/L to 478.9 mg/L. Fifty (50) different brands of fruit juices were analysed. Sample 4B had high concentrations of benzoic acid whereas Sample 9B had lowest concentration of benzoic acid. The estimated daily intake of benzoic acid for fruit juices for children age range from 4 to 12 years old was between 1.5 mg/L to 3.4 mg/L which were within the range of the acceptable daily intake (ADI) of benzoic acid (0-5 mg/L of body weight). Twenty one (21) of the samples contained levels of benzoic acid above the 350 mg/L which is the limit specified in Food Regulation 1985. The limit of detection and quantification for benzoic acid analysis was 0.03 mg/L and 0.10 mg/L.

*Keywords: Preservatives, benzoic acid, fruit juice, health risk, acceptable daily intake.*