

**UNIVERSITI TEKNOLOGI MARA**

**GENOTOXICITY STUDIES OF *EUGENIA*  
*POLYANTHA* LEAF EXTRACT**

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## ABSTRACT

*Eugenia polyantha* (EP), family Myrthaceae, is widely distributed in South East Asia and is used as a food flavouring which contains flavonoids, tannins and alkaloids. Numerous *in vitro* studies have shown that flavonoids are potent antioxidants and metal chelators. However, several studies showed polyphenol has the ability to induce genotoxicity. A study was conducted and have proven that EP is minimally toxic when assessed in WRL 68 and HepG2 cell lines using MTS assay. Thus, the aim of this study is to further confirm the safety of this herb by assessing the genotoxicity of EP leaf extract in normal and cancerous liver cell line, WRL 68 and HepG2 using comet assay. *Salmonella typhymurium* tester strains (TA1535 and TA1537) were used in the Ames' test to determine the degree of the mutagenicity of this plant. A dose-dependent effect of the extract on both cells was observed in the comet assay and it caused minimal damage to DNA, characterized by the degree of damaged to the nuclei. The test compound of EP extract of various concentrations also showed minimal mutagenicity towards the *Salmonella* tester strains indicated by number of revertant colonies after 72 hours of incubation. In conclusion, EP leaf extract are not genotoxic and safe for consumption.

Keywords: *Eugenia polyantha*, degree of damaged, revertant colonies

# CHAPTER ONE

## INTRODUCTION

### 1.1 Introduction

Naturally occurring compounds can have important effects on the consequences of exposure to mutagens and carcinogens. Current scientific interest is directed towards the cancer-preventing potential of naturally occurring constituents of the diet (Verhagen et al., 1993). As such, many foods (e.g. fruits and vegetables, like cabbage, leeks, citrus fruit, herbs and spices) and food ingredients (e.g. antioxidant vitamins, flavonoids, glucosinolates, organo-sulfur compounds) have been claimed to have antimutagenic or anticarcinogenic potential (Steinmetz & Potter, 1991).

Many epidemiological studies have found that, diets containing a large number of vegetables and fruits can help consumers against a variety of diseases, including coronary heart disease, stroke and cancer (Miller, 1990; Steinmetz & Potter, 1991; Keli et al., 1996). This is due to the presence of the phytochemicals in vegetables and fruits (Boyer & Liu, 2004). A part of these phytochemicals may serve as antimutagens to reduce the production of cell mutation and cancer progression besides its antioxidant effects to protect DNA against oxidation damage (Gupta et al., 2002).