UNIVERSITI TEKNOLOGI MARA

EVALUATION OF SOLVENT AND TEMPERATURE ON THE YIELD OF POLYPHENOLS IN BLACK TEA

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ABSTRACT

Camellia sinensis from the Theaceae family is commonly called tea and it is rich in antioxidants, polyphenols. This research deals with the plant, in which the main focus is to obtain the yield of total polyphenols from the leaves. The objectives of this study are to determine the effect of different types of solvents and different temperatures (60°C, 70°C and 80°C) on the yield of polyphenols. The dried leaves undergo Soxhlet extraction for 30 minutes by using 2 types of solvent systems which are ethyl acetate : ethanol (2:3) and ethanol : water (1:1). The total phenolic content is determined by using Folin-Ciocalteau method in which gallic acid is used as a standard compound. The total phenolic content is calculated by using the gallic acid standard curve equation : $y = 0.0003x + 0.008$. All determination was performed in triplicate. For respective temperature at 70°C, the mixture of ethyl acetate : ethanol soluble sample gave the highest total phenolic content of (74.22 ± 10.61) mg/g.

CHAPTER 1

INTRODUCTION

1.1 Introduction

Tea has been cultivated for centuries beginning in China. Today, tea is the most widely consumed beverage in the world second only to water (Richardson, 2010). Many people drink tea and studies suggested that green tea (*Camellia sinensis*) in particular has many health benefits (Horner, 2007). Tea is of the genus Camellia, a genus of flowering plants in the family Theaceae (Bryant & Bryant, 2004). *Camellia sinensis* is an evergreen shrub or small tree that has seeds that can be pressed to yield tea oil (Johnson, 2013). Plus, tea tree oil also can be yielded by pressing the seeds of *Camellia sinensis* together with *Camellia oleifera* (Trehane, 1998). Different types of tea such as, green tea, black tea and oolong tea which are all from this species but the difference is how the teas are processed (Juneja *et al.*, 2013). Green tea is made from unfermented leaves and reportedly contains highest concentration of powerful antioxidant called polyphenols (Mandel, 2010). Oolong tea is the mid fermented tea while black tea is the fermented tea. Green teas are subjected to minimal oxidation whereas oolong and black teas are subjected to partial and extensive oxidation (Juneja *et al.*, 2013). The fresh green tea leaves contain about 36% of polyphenols (Perva-Uzunalić *et al.*, 2006). Some studies showed that polyphenols can kill cancer cells. Different leaf ages produce different qualities of tea as they contain different chemical compositions.