

**EFFECTS OF DECOCTION AND INFUSION ON THE ANTIOXIDANT
PROPERTIES OF HERBAL TEA FROM DRIED PINK GUAVA
LEAVES**

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ABSTRACT

EFFECTS OF DECOCTION AND INFUSION ON THE ANTIOXIDANT PROPERTIES OF HERBAL TEA FROM DRIED PINK GUAVA LEAVES

Traditional herbal medicines form an important part of the healthcare system of Malaysia. *Psidium guajava* L., supposed to be the oldest medical system in the world, provides potential leads to find active and therapeutically useful compounds from plants. This study was conducted to investigate the effects of dried ground leaves of *Psidium guajava* L. (guava) extracted with water using different stepping methods (decoction and infusion) and different time intervals (10 minutes, 15 minutes and 20 minutes). Toxicity test using BSLA (Brine Shrimp Lethality Assay) method exhibited LC₅₀ more than 500 ppm, which means that the leaves were safe for consumption. The total phenolic content in the extracts was determined spectrophotometrically according to Follin-Ciocalteu's phenol method. The results indicated that the 10 minutes infusion possessed the highest total phenolic content 239.70 mg GAE/100 g of dried weight material. The antioxidant properties of freeze dried pink guava leaves extracts were determined by means of 2,2-diphenyl-1-picrylhydrazyl (DPPH) colorimetry and reducing ferric ion antioxidant potential (FRAP) assays. The activity was evaluated by the decrease in absorbance as the result of DPPH colour change from purple to yellow with detection wavelength at 517 nm. The higher the sample concentration used, the stronger was the free radical-scavenging effect. On the other hand, the ability of the extracts to reduce Fe (III) to Fe (II) and to bind to Fe (II) ion was determined by spectrophotometer with detection wavelength at 700 nm. The results obtained showed that the decoction method was higher in the antioxidant activities compared to infusion method. This study revealed that the decoction method of guava leaf tea comprise effective potential source of natural antioxidant and this very important for the human health.

CHAPTER 1

INTRODUCTION

1.1 Background

It is well known that reactive oxygen species (ROS) formed in vivo, such as super oxide anion, hydroxyl-radical and hydrogen peroxide, are highly reactive and potentially damaging transient chemical species. Tissue damage resulting from an imbalance between ROS-generating and scavenging systems has been implicated in the pathogenesis of a variety of disorders including degenerative disorders of the CNS, such as Alzheimer's disease, cancer, atherosclerosis, diabetes mellitus, hypertension, AIDS and aging (Halliwell and Gutteridge, 1998; Mantle *et al.*, 2000). Antioxidant refers to a compound that can delay or inhibit the oxidation of lipids or other molecules by inhibiting the initiation or propagation of oxidative chain reactions and which can thus prevent or repair damage done to the body's cells by oxygen.

They act by one or more of the following mechanism: reducing activity, free radical-scavenging, potential complexing of pro-oxidant metals and quenching of singlet oxygen. Epidemiological studies have shown that many photonutrients of fruits and vegetables might protect the human body against damage by ROS. The consumption of natural antioxidant photochemical was reported to have potential health benefits (Di Carlo *et al.*, 1999; Pulido *et al.*,