UNIVERSITI TEKNOLOGI MARA

PHYTOCHEMICAL ANALYSIS OF EXTRACT FROM SPONTANEOUS FERMENTATION OF PAPAYA LEAF

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ABSTRACT

In this study, phytochemical analysis was carried out on spontaneously fermented papaya (*Carica papaya*) leaf extract in terms of total phenolic content (TPC), total flavonoid content (TFC), and antioxidant activity. Moreover, the aim was to relate the presence of the metabolic compounds with the therapeutic benefits of the naturally fermented C. papaya leaf. Extraction method used solvent extraction by using methanol. Estimation of TPC and TFC used Folin-Ciocalteu's reagent and aluminium chloride respectively, whereas antioxidant activity used DPPH and Trolox as radical and antioxidant models respectively. The results showed the difference of TPC, TFC, and antioxidant activity of different samples taken at different sampling points throughout the 90 days fermentation period. The highest TPC and TFC and TFC were recorded at day 30 (79.84 \pm 0.29 mg GAE/g) and day 20 (51 \pm 2.17 mg QE/g) respectively, whereas the highest antioxidant activity was recorded at day 30 (42.41 mM TE/g).

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CHAPTER 1 INTRODUCTION

This chapter 1 defined the entire research project. Firstly, it describes the area of the study. Next, several problems are determined from the current research. From the problem statement, the research project will be focused on the scope of the study and also the objectives of the research project.

1.1 Research Background

In Malaysia, medicinal plants that have been found thousand years before can now be found in variety of herbal products and also become Malaysian health care system due to their therapeutic efficacy. In recent years, some of herbal plants were introduced to this country since the tropical climate is suitable for their growth. For instance, one of the famous herbal plant in Malaysia which is papaya or scientifically known as *Carica papaya* needs humidity and adequate rainfall of 1,800 millimeters in order to gain optimum yields (The Daily Records, 2017). Because of its nutritional benefits, almost all citizens in Malaysia are familiar with this plant. Other countries such as India, Brazil, and Nigeria are also producing this papaya crop.

Historically, during last few decades, progress that involves biological activity and medicinal application of papaya has been accomplished and nowadays it is measured as valuable nutraceutical fruit plant due to its multifaceted properties (Krishna, Paridhavi, & Patel, 2008). All parts of *Carica papaya* are excellent source of Vitamins A, B and C, proteolytic enzymes such as papain and chymopapain that has properties of antifungal, antibacterial, and antiviral (Yogiraj, Goyal, Chauhan, Goyal, & Vyas, 2014). Normally, it is widely consumed as fresh fruit, juice, jam, pickles, canned fruits, and dried fruits. However, people nowadays have more interest to the leaves as the extracts from *Carica papaya* leaves contain phytochemical or metabolite compounds such as phenolic, chitinase, alkaloid, glutaminyl cylase, quercetin, cysteine endopeptides, and kaempferol that give treatment to many diseases for human and even animals (Vyas, Khatri, Ram, Dave, & Joshi, 2014). It can treat diseases such as eczema, warts, corns, sinuses, cutaneous tubercles, glandular tumors, blood pressure, dyspepsia, constipation, and amenorrhea (Yogiraj et al., 2014).