

**UNIVERSITI TEKNOLOGI MARA**

**SUPERCRITICAL CO<sub>2</sub>  
EXTRACTION  
OF JACKFRUIT SEEDS**

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# ABSTRACT

Everybody from all races in Malaysia know the local fruits, Jackfruits. Their favourite is Tekam Yelow (Nangka Madu). Some Jackfruits fanatics willing to buy fresh Nangka Madu at Pahang from nearby fruits stall along the roads. The Jackfruits will be freshly eaten or consumed as improvised sweet desserts. Definitely, the Jackfruits seeds are consider as waste in the rubbish bin. Not noticeable, people will spend their money on the expensive grape fruits' seeds supplements since they knows the beneficial medicinal value contained inside Jackfruit seeds. Therefore, a study on the medicinal compounds contain in the Jackfruits seeds will be conducted. There are lots of research had been conducted in the determining the medicinal and other kinds of beneficial that can be obtained from Jackfruit's seeds. Various extraction technique had been used but no research on Supercritical CO<sub>2</sub> extraction (SC-CO<sub>2</sub>) of Jackfruits seeds being perform. The extraction equipment used in this research is SFT-100 with vital operating variables to be examined were at temperature (50°C, 60°C) with pressure (4000psi, 5000psi, 6000psi). While the extract was tested using Gas Chromatography-Mass Spectrometry (GC-MS), Varian GCMS 450 GC 240 MS Ion Trap. The highest oil yield obtained was 0.31%. There are 6 major medicinal constituent obtained after analysed which were (1-Methoxy-pentyl)-Cyclopropane, Dodecanoic acid, n-Hexadecanoic acid, Vitamin A aldehyde, Cholestan-3-ol, 2 methylene-, (3á, 5à) and 1-Heptatriacotanol. Jackfruits seeds have the medicinal abilities namely, antimicrobial, anticancer, antioxidant, anti-inflammatory, acne treatment and others medicinal values.

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# CHAPTER ONE

## INTRODUCTION

### 1.1 Research Background

#### 1.1.1 Jackfruits

*Artocarpus heterophyllus* commonly referred to as Jackfruits is a delicious yellowy fruit in our daily course or snack. Malaysian accepted it as 'Nangka'. In Malaya, sorts of Jackfruit existed, i.e. J32 (Mantin), J33 (Tekam Yellow) and J35 (Mastura), but most Malaysian well-liked is Tekam Yellow (Nangka Madu) as a result of its texture was less juicy however tasted sweeter than Mantin and Mastura (Marketing, 2013). Jackfruit is a non-seasonal plant. From (Table 1) in the appendix shown an average of 30,000 metric ton Jackfruit produces from 2012-2017. Indicate that Jackfruit is truly one amongst the economical plantation in Malaya. Jackfruit's pulp were consumed for many reasons likes eaten up as vegetable, preserved or canned in brine or curry, created into varied native delicacies like 'dodol' and preserved as table crackers. Whereas the Jackfruit seeds will always be treated as wastes. Actually Jackfruit seeds were found to be made in proteins, carbohydrates and minerals with moderate amount of phytochemicals and strong matter properties. It additionally a fat free diets as a result of the fat content was negligible. The results of varied in vitro inhibitor activity assays indicated that extracted seeds possessed considerable DPPH, ABTS scavenging effects and metal particle chelating activity throughout a concentration-dependent manner. Moreover, Jackfruit has numerous medicinal uses particularly antioxidant (phenolic contents), anti-inflammatory, antimicrobial, anti-cancer and anti-fungal activity (Vazhacharickal & Mathew, 2015) Methanolic extracts from jackfruit seed contain flavonoids, tannins and saponins (terpenoids) and so making this because the initial study to prove that jackfruit seed potential as a candidate for future anticancer medical care. (Oktavia, Wijayanti, & Retnoaji, 2017). Moreover, the methanolic testa extract of (*A. heterophyllus*) showed potential in inhibitor, receptor binding activity with RBCs, in vitro medicament activities, antifungal activities and medicine activity since polyphenols and flavonoids present in the testa (Saha, Jamiruddin,