

UNIVERSITI TEKNOLOGI MARA

**EXTRACTION AND PHYTOCHEMICAL
SCREENING OF THE *PANDANUS* ROOT
CAPS**

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ABSTRACT

Pandanus is the largest genera in Pandanaceae family. The *Pandanus* species is usually found along coastal region from the Southeast Asia to the Pacific Island. Almost all parts of *Pandanus* species have been used for many purposes in daily life. For example the leaves are used as colouring and flavoring agents in cooking. Other than that the bark and large branches are used in construction of houses. Besides all of the non-medical values, *Pandanus* species also have been traditionally used as medications for the treatment of several diseases such as fever, stomach cramp, joint pain and many more. Amazingly, some of the medical properties of *Pandanus* species are proven by several scientific researches and the active constituents responsible for the effects were successfully identified and isolated. The objectives of this research are to study the biomedical properties of the *Pandanus* species as well as to screen and isolate chemical constituents that may present in the root caps of the plant. In this research paper, the focus is on two species which are *Pandanus tectorius* (*P. tectorius*) and *Pandanus dubius* (*P. dubius*). The biomedical properties of *Pandanus* species are studied based on the literature review of recent studies. To isolate the chemical constituents of the root caps of the plants, extraction was performed. For this purpose, the samples were reduced into smaller particles by grinding and milling prior to maceration in methanol solvent. The crude extract was subjected to thin layer chromatography (TLC) and preparative TLC. Six compounds were successfully isolated. Finally, two compounds **L₁** and **S₃** were chosen to be analyzed using nuclear magnetic resonance (NMR) spectroscopy. However, only NMR for **S₃** gave more promising information and was proposed to be a triterpene.

CHAPTER 1

INTRODUCTION

1.1 Background

Pandanaceae is characterized by palm-like trees with long, narrow, rigid, spirally arranged pineapple-like leaves and prop roots. *Pandanus* is one of the four genera in the Pandanaceae family. The other three genera of the Pandanaceae family include *Freycinetia*, *Sararanga* and *Martellidendron*. Among the four genera, *Pandanus* has the broadest geographical distribution with approximately 600 species with tree and shrub habit (Nadaf & Zanan, 2012).

Pandanus species are one of the most famous plants that had been used as traditional folk's medicine. They are believed to be effective in elevating minor ailments such as fever, headache, sore throat and others (Takayama *et al.*, 2001; Tan, 1980). Other than their medical effects, *Pandanus* species are also known as one of the most important ingredients in cooking especially among Asian. For example, the leaves of *Pandanus amaryllifolius* (*P. amaryllifolius*) or also known as 'Pandanus' which is long and green, is used as additives to enhance the flavor and give a pleasant fresh hay like aroma (Ooi, Wong, Sun, & Ooi, 2006).

With the help of modern technologies, several *Pandanus* species had been scientifically evaluated and proven for their possible medicinal application. Studies had been conducted to identify the chemical constituents and their therapeutic effect that may lie within the plant. For example, the extracts of prop roots of *Pandanus fascicularis* (*P. fascicularis*) produce significant antidiabetic activity and