CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Medicinal plants are of great importance to the health of individuals and communities in general. They are useful for healing as well as for curing of human diseases because of the presence of phytochemical constituents. Phytochemical are naturally occurring in the medicinal plants, leaves, thorns, vegetables and roots that have defence mechanism and protect from various diseases. Phytochemical are primary and secondary compounds. Primary constituents include the common sugars, amino acids and proteins. While, secondary constituents are the remaining plant chemicals such as alkaloids (derived from amino acids), terpenes (a group of lipids) and phenolics (derived from carbohydrates) (Wadood et al. 2013). Reactive of free radical from the secondary constituents can be used in several activities, such as anti-fungal activities, antimicrobial activities and anti-diarrhoeal activity.

Ceiba petandra is one of the medicinal plants used for researches in extraction of oil for phytochemical studies. Ceiba Petandra which is locally known as kapok or kekabu is a native in America and West Africa. Ceiba Petandra belongs to the Malvaceae family (Rajeswari et al. 2013). Ceiba petandra have been recommended for the treatment of bronchitis, diabetes, diarrhoea, skin diseases, painful aye diseases and chronic fever (Elumalai et al. 2012). All the parts of this plant (leaves, stems, roots and even whole parts) have numerous therapeutic activities for the treatment of variety diseases. (Activity et al. 2009) reported that the extraction of stem bark oil can be used as an anti-microbial because the phytochemical contents exist. While, (Odinma 2013)
presented the work on extraction of stem bark oil consists flavanoids, saponins and alkaloids. These phytochemical can be used in anti-antibacterial.

Among the part of medicinal plants used for researches in extraction of oil for phytochemical studies, thorns of ceiba petandra is a new part as a raw material for extraction process have been explored and it is found that thorn of ceiba petandra has potential for the extraction process (Dangi et al. 2014). Many studies had been done on extraction of oil from ceiba petandra for phytochemical studies by using soxhlet apparatus (Anosike et al. 2012) and (Odinma 2013).

**Figure 1-1:** Thorns of ceiba petandra

Therefore, this project comes out with a well-established technique to extract thorns of ceiba petandra by using soxhlet apparatus at optimum conditions. It offers higher yield and selectivity within hours. None of the reported literature on extraction of ceiba petandra using thorns as a plant sample for phytochemical analysis. Therefore, the present projects attempts to explore the potential of utilizing indigenously available thorns of ceiba petandra oil in the phytochemical study.
1.2 PROBLEM STATEMENT

Several problem statements of this research are:

i. In Malaysia, the application of the ceiba petandra as a medicine is not commercially used.

ii. Little research had been done on thorns of ceiba petandra.

1.3 OBJECTIVES

This study embarks on the following objectives:

i. To study the optimum operating condition for process of extraction of ceiba petandra.

ii. To extract phytochemical exist in the ceiba petandra plant.

1.4 SCOPE OF STUDY

This project focus on the application of soxhlet apparatus assisted technique to extract oil from thorn of ceiba petandra. Optimization of the two parameters affecting extraction process including type of solvent and weight ratio between raw material and solvent used will be studied. Comparison will be made between results of experiments using different type of solvent which are methanol and ethanol. Study also will be made to see the suitable ratio between raw material and solvent used; 1:10, 1:15 and 1:20 to achieve high yield of the extracted oil. The extracted oil product produced from optimized condition with highest yield will be analyzed phytochemical content exist in the thorn of ceiba petandra plant. In this project, three type of phytochemical content will be analyzed by using several tests based on Table 1-1. The gas chromatography mass chromatography analysis also will be done for the confirmation of the result obtained.

Table 1-1: Analysis of the phytochemical content in thorn of ceiba petandra

<table>
<thead>
<tr>
<th>Phytochemical</th>
<th>Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flavanoids</td>
<td>Zinc hydro chloric acid</td>
</tr>
<tr>
<td>Tannins</td>
<td>Gelatin test</td>
</tr>
<tr>
<td>Alkaloids</td>
<td>Mayer</td>
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