CHAPTER 3

METHODOLOGY

3.1 INTRODUCTION

In order to study the optimum condition of oil extraction from ceiba petandra and to analyze the phytochemical contents of the ceiba petandra plant, several important variables will be tested such as the type of solvents used for the extraction process and the weight ratio between the solvent and the sample. In this experiment, two major stages will be introduced in order to choose the best extraction condition and the most suitable solvent to extract the maximum percentage of oil from ceiba petandra plant. Basically, the methodology of this research consist of four major parts including pretreatment of sample, extraction process by using soxhlet apparatus, separation process by using rotary evaporator and sample analysis. Figure shows the flow process for all method procedures.
3.2 PRE-TREATMENT METHODS

Thorns of ceiba petandra (kekabu) were used in this study. Before proceeding to extraction process, pre-treatment methods were applied to the thorns of kekabu which are drying and grinding. The samples were washed with water to remove dirt and soil. The samples were next grinding to small pieces. Then, the pieces were dried using oven at 60 °C within 20 minutes. The sample is kept under dried condition for further use.
3.3 EXTRACTION PROCESS (SOXHLET APPARATUS)

The soxhlet apparatus was set up based on Figure 3.3. The water tap as supplies continuously to the extractor to condense the vapour of solvent and oil. Then, 300 ml of solvent was poured into 500 ml of conical flask. The 30 g of thorns of ceiba petandra plant was placed in the thimble before placing it into the extractor chamber. The heater was on to start the extraction process. The product was collected in the boiling flask.

![Soxhlet Extraction Set Up](image)

**Figure 3.3**: Soxhlet Extraction Set Up

To study the effect of solvent on the extraction of the plant, two different type of solvent were used; methanol and ethanol. The extraction time was constant at 6 hours. For the weight ratio between solvent and sample effect, the volume and the mass of solvents and sample used were varies at 1:10 (w: v), 1:15 (w: v) and 1:20 (w: v). The three trial were done in order to get the approximately results.

The mixture and solvent collected in the flask were cooled for 1 hour before it can be placed in the 200 ml reagent bottle. The filled reagent bottles were labelled and