

# CHAPTER I

## INTRODUCTION

### 1.1 Background

The development of the utilization of various biopharma sources from plants with various levels ranging from basic ingredients extracts to pure compounds has marked the rapid development of the use of materials that are strengthened with the desire to back to nature (Suarsana *et al*, 2015).

Plants are an important component in human life, especially as a food source and as medicine. The Qur'an mentions a lot about plants for human use. As the word of Allah SWT in the Qur'an surah Thaha verse 53 which reads :

الَّذِي جَعَلَ لَكُمُ الْأَرْضَ مَهْدًا وَسَلَكَ لَكُمْ فِيهَا سُبُلًا وَأَنْزَلَ مِنَ  
السَّمَاءِ مَاءً فَأَخْرَجْنَا بِهِ أَزْوَاجًا مِنْ نَبَاتٍ شَتَّىٰ

*It means “(God) who made the earth an expanse for you and made the roads on it for you, and who sent water (rain) from the sky. Then we grow with it (rainwater) various types of various plants.”*

Allah SWT created a variety of plant species, ranging from plants high level to a low level. Plants empirically have antimicrobial activity and have many benefits that we can take. There is no something created by Allah SWT is something that is useless, no matter how small creations definitely have benefits for human survival (Latifah, 2015).

The development of medicine by utilizing medicinal plants can be an aid to be as old as human age itself. Since long ago, food and medicine cannot be separated. Many plants are consumed by the ancestors who also believed and shown to have healthful properties. In the world of medicine, a concept or method of treatment using ingredients derived from medicinal plants (herbs) is called herbology. One plant that is known to have many

benefits is betel leaf (*Piper betle* L.). Betel leaf has many health and beauty properties (Rosdiana dan Wulan, 2014).

Betel plants (*Piper betle* L.) originated from central and eastern Malaysia, then brought and cultivated more than 2500 years ago throughout Malaysia and tropical regions in Asia (Suarsana *et al*, 2015). Betel leaf is a plant that grows in Indonesia and can be easily found anywhere. The efficacy of betel leaf as a great healing medicine has been very popular since a long time ago. The various result of scientific research concluded that the betel has very nutritious content and millions of benefits for health (Rosdiana dan Wulan, 2014). The characteristics and medicinal properties of betel leaf medicine are well known, so this plant is widely used in India, Indonesia and other countries in the Indo-China region (Malaysia, Vietnam, Laos, Cambodia, Thailand, Myanmar, Singapore) (Suarsana *et al*, 2015).

Betel leaf (*Piper betle* L.) contains bioactive compounds including, methyl eugenol, carvacrol, cavical, alyl catechal, calribetol, cineol, estragole, essential oils, tannin, alkaloids (arakene), flavonoids, anthraquinone, and steroid components (Suarsana *et al*, 2015). The use of betel leaf for medicine is due to the presence of essential oils contained (Naini, 2006). Betel leaf essential oil can inhibit the proliferation of protozoa and parasites. Saponins and tannins act as antiseptics on surface wounds. Another compound that is beneficial to green betel is flavonoids. Flavonoids in addition to functioning as a bacteriostatic also function as an anti-inflammatory (Mursito, 2002).

Flavonoids are one of the largest natural phenol compounds found in all green plants (Markham, 1988). Flavonoids have a characteristic that is a very sharp odour, most of which are yellow pigment, can dissolve in water and organic solvents, readily decompose at high temperatures (Rahmat, 2009). In addition, flavonoids are antimicrobials capable of forming complex compounds with proteins through hydrogen bonds, which can damage bacterial cell membranes (Iwan dan Nur, 2010). Flavonoids compounds are spread in almost all parts of plants both in the roots, bark, flowers, fruit, seeds, and leaves (Hanani, 2015).

The active substance in green betel leaf, especially flavonoids, can be obtained using the extraction technique. Extraction is a way of taking active substances contained in simplistic using suitable solvent (Sulistyawati, 2009). The appropriate extraction technique based on the properties of active substances in green betel leaves is maceration and infusion. Maceration is assessed as appropriate for the extraction of the flavonoids compounds, because the flavonoids are polar so that they are easily soluble in the polar solvents, such as ethanol, methanol, acetone, and butanol (Hanani, 2015). In addition, flavonoids can also dissolve in water and easily unravel at high temperatures which also correspond to the working procedure of the infusion method (Mercy, 2009). The second selection of extraction methods based on a simple process and requires not too much equipment (Hasim *et al*, 2016).

Based on the description above, the author is interested to know the influence of different extraction methods on total flavonoids levels in the betel leaf extract. In this study used betel plant that is part of a leaf. Extraction is done using maceration and infusion methods. Measurement of total flavonoid levels in extracts was performed by UV-Vis Spectrophotometry.

## **1.2 Problem Statement**

- a. How does the comparison of maceration and infusion extraction methods affect the percentage of the resulting yield in green betel leaf extract (*Piper betle* L.) ?
- b. How is the comparison of maceration and infusion extraction methods affect the total flavonoids levels in green betel leaf extract (*Piper betle* L.) ?

## **1.3 Research Objectives**

- a. The purpose of this research is to find out and analyze the kind of simple methods that are best of maceration and infusion extraction methods to produce percentage of yield.
- b. The purpose of this research is to find out and analyze the kind of

simple methods that are best of maceration and infusion extraction methods to produce total levels of flavonoids in green betel leaf extract (*Piper betle* L.).

## **1.4 Research Benefits**

### 1.4.1 Theoretical Benefits

Provides a clear scientific explanation of the simple method which is most effective in extracting betel leaf (*Piper betle* L.) and total flavonoids levels acquired for each method.

### 1.4.2 Application Benefits

- a. Basic research as a material for further research.
- b. Contribute to the development of herbal-based medicines with raw materials of green betel leaf extract (*Piper betle* L.) as a treatment.