

CHAPTER I

INTRODUCTION

1.1 Research Background

Throughout history, tea has been a significant drink that ranges from ceremonial purposes, medicinal purposes or for leisure and found across multiple cultures and regions (Castleman, 2001). Herbal tea refers to the infusion or addition of herbs, spices, seeds, or plant steeped in hot water. Herbal tea however is not considered as true tea as it is derived from other plant source other than *Camellia sinensis* and are usually caffeine free (Daniels, 2016). Herbal tea is widely known as a medicinal tool that aid several types of illness depending on the plant source such as stomach pain, sore throat and other ailments. It is considered to be on of popular beverage choices for children and adults alike. Different treatments applied to raw tea leaves produce different types of tea i.e. unoxidized, half- oxidized and fully oxidized tea leaves. Tea types from around the world include; white tea, green tea, blue tea, black tea, yellow tea and dark tea (Hara *et al.*, 2017).

Indonesia is a tropical country that is rich in plant varieties. Many indigenous plants have been researched and applied to modern food industries, but due to the vast variety of indigenous plants, there are those that still have limited research and data but is culturally consumed and claimed to have functional properties. *Plectranthus amboinicus* Lour. Spreng. or locally known as *Torbangun* or Bangun-Bangun leaves falls into the latter category, where leaves

are already largely consumed around its place of origin but minimal research and studied applications have been published. This North Sumatran indigenous leaf is known to aid lactating women in terms of milk quality and quantity and categorized as a lactagogue (Damanik, 2009). A food source can be categorized as a lactagogue if it is seen to have compounds and effects that aid in better milk quality or quantity of lactating women. Due to its abundance in minerals, vitamins and antioxidant, *Torbangun*-based products are starting to gain popularity amongst Indonesian mothers, even though there is still limited studies that show direct correlation between the two apart from cultural tradition and beliefs.

Trigonella foenum-graecum or known as Fenugreek seeds has been used in herbal tea and other lactagogue products and is seen to have properties that aid in milk production (El Sakka *et al.*, 2014). Indonesia has started using Fenugreek in products aimed to aid lactating women. Studies have shown that Fenugreek seeds are abundant in flavonoids including as well rich in vitamins and amino acids (Shi *et al.*, 2010). Both *Torbangun* and Fenugreek is categorized as lactagogue for its abundance in compounds that can improve milk quality and quantity. However a combination of the two has yet to be further analyzed.

The application of *Torbangun* leaf for herbal tea beverage coupled with Fenugreek seeds would catapult its status and provide a potential product that is effective and easily accessible as a beverage for lactating women.

1.2 Research Problem

Torbangun is a plant native to North Sumatra, Indonesia. *Torbangun* leaves are consumed for its abundance in flavonoid, micronutrient and active

elements (Devi, 2010). Its long history in Batak culture as a means of aiding lactating women in terms of milk quality and quantity have been around for hundreds of years but limited research is available to the public (Damanik, 2009). The finite amount of documented research and analysis limits the application of *Torbangun* as a lactagogue also as herbal tea and its antioxidant properties. Fenugreek has an extensive history as a medicinal herb, used as digestive aids and to heal ailments (Shi *et al.*, 2010). However, studies also show its benefits as a lactagogue and is rich in flavonoids and vitamins (Zibadi *et al.*, 2013).

The application of Fenugreek seeds and *Torbangun* leaves as herbal tea has yet to be analyzed. The type of tea that yields the best antioxidant characteristics as well as the optimum ratio between the two materials is unknown. Thus, further research regarding its antioxidant properties is needed.

1.3 Objectives

1.3.1 General Objectives

The general objective of this research was to study the effects of ratio towards antioxidant properties of *Torbangun* leaves (*Plectranthus amboinicus* L. Spreng) and Fenugreek seeds (*Trigonella foenum-graecum*) when prepared as a herbal tea beverage.

1.3.2 Specific Objectives

The specific objectives of this research was to:

1. Determine the antioxidant properties of fresh *Torbangun* leaves and Fenugreek seeds

2. Determine the optimum tea processing method in terms of antioxidant properties for *Torbangun* leaves.
3. Determine the effect of adding Fenugreek seeds to *Torbangun* tea on the antioxidant properties when brewed in different conditions.
4. Determine the effect of brewing methods of Fenugreek seeds to *Torbangun* tea on antioxidant properties when brewed in different conditions.
5. To study the acceptance of *Torbangun*-Fenugreek herbal tea through organoleptic test.

