

CHAPTER I

INTRODUCTION

1.1 Background

Kombucha is a traditional beverage made from fermenting tea with symbiotic culture of bacteria and yeasts (SCOBY). It is originated from Manchuria which then spread to Russia, Germany and the rest of the world (Walsundata, *et al.*, 2015). However, it is still not a popular beverage in Indonesia as there are not a lot of research that has been done about the production of kombucha. In Indonesia, healthy lifestyle is becoming more popular where people nowadays are more concern about the health benefits when choosing the food or drink that they are going to consume. Kombucha is known to be beneficial for human health such as for metabolic disease, arthritis, constipation, curing cancer etc. that has slightly sweet and acidic with a sparkling flavor that is desirable in a beverage (Fu, *et al.*, 2013).

Indonesia is a tropical country that has a lot of coffee and tea plantations with almost 80% of the populations are working as a farmer. The production of coffee in Indonesia is known to be the third in the world in terms of coffee Robusta (*Coffea canephora*) while for tea, it is known to be the top 6 producers of tea in the world. Both tea and coffee are the two most popular beverages in the world due to its health benefits and its unique taste (Nurfadilah, 2017). Coffee Robusta (*Coffea canephora*) is the most produced type of coffee among others in

Indonesia (USDA, 2016) where the plant is usually grown in low altitudes. It is known to have high antioxidant and caffeine level among other refreshments. According to USDA (2016), Indonesia is the fourth largest country producer of coffee due to its geographical location for coffee plantation.

The usage of coffee beans from coffee Robusta plant made a popular beverage to both young and adults where billions of cups are enjoyed every year by consumers around the world. While, the leaf itself is not yet popular to be used to produce food or drink. Many people have a perspective that the leaf of a coffee plant would taste like the coffee itself which is a common misconception. The research in making tea of coffee Robusta leaf has been done by Siringiringo, *et al.* (2012). In this research, the best method to produce tea made from coffee Robusta leaf was done by 90 days fermentation with 95°C drying temperature with slightly more bitter taste than tea made from *Camelia sinesis*.

Research on kombucha made from *Camelia sinesis* green tea has been done by Prasetya (2017). The research was done with different types of sugar (sucrose, fructose and dextrose), different fermentation time (5 – 9 days) and different starter or mother tea (liquid and SCOBY of kombucha). The best result was determined by organoleptic test that was obtained in kombucha with formulation of sucrose with either of the starters in 7.13 days fermentation. Different forms (liquid and SCOBY) of mother tea were not significant in terms of lactic acid bacteria and yeast content at $p < 0.05$. However, using SCOBY as a starter will require vinegar or the liquid starter to lower down the pH of the kombucha solution to create suitable fermentation conditions for the *Acetobacter*

xylinum and yeast (Markov, *et al.*, 2006). While for kombucha that was made with coffee Arabica (Wulandari, 2014) has optimum formulation in 8 days fermentation with 40g/300 mL tea concentration and in also 8 days fermentation with unknown concentration of coffee Arabica leaves (Suhardini and Zubaidah, 2016). based on antioxidant activity. Hence, for this research, both combination of coffee and tea as a beverage were done to optimize the usage of coffee Robusta leaf into a healthy refreshment. The research was done to make a product of kombucha from coffee Robusta (*Coffea canephora*) leaves modified from Napitulu, *et al.* (2015) that has made kombucha from coffee Arabica leaves, coffee Robusta leaves tea and Prasetya (2017) that made kombucha from *Camelia sinensis* green tea).

1.2 Research Problem

Coffea canephora plant is usually grown for its seeds to be made into coffee. The flesh of the fruits itself or the cherry coffee is further processed into cascara tea or decomposed into fertilizer while abandoning the potential use of its leaves to be processed into food or beverage products., further studies are needed to study about coffee Robusta leaves ability to produce kombucha. Moreover, as healthy lifestyle is becoming more popular in Indonesia, further analysis is needed in Kombucha as a functional drink by utilizing the potential of local source. In this case, the local source is *Coffea canephora* leaf. This is done to increase its economic value despite being wasted.

1.3 Objectives

1.3.1 General Objectives

The objective of this research was to optimize the tea content and fermentation time of kombucha prepared with coffee Robusta (*Coffea canephora*) leaves by conducting an analysis on phenolic content, caffeine content and organoleptic test.

1.3.2 Specific Objectives

The specific objectives of this research were;

1. To determine the optimum type of sugar to make kombucha.
2. To determine the optimum fermentation time of kombucha based on antioxidant activity, amount of lactic acid bacteria and organoleptic test.
3. To obtain optimized condition of kombucha production (fermentation time, types of sugar and tea concentration).