

# CHAPTER I

## INTRODUCTION

### 1.1. Background of Research

The development of an understanding of functional compounds in food drives awareness for consumers about the importance of health. An increasingly widespread understanding plays a role in developing the modification trend of food with some additional food ingredients that provide health benefits (Olmedilla-Alonso *et al.*, 2013). Functional components of food such as vegetable protein, fiber, lactic acid bacteria, and herbal plants can be added to meat products directly during the processing to increase the functional value of food (Zhang *et al.*, 2010). Functional food is food that can provide health benefits for those who consume it (Das *et al.*, 2011).

Indonesia is a country known for its rich natural resources, especially in various kinds of food. Indonesia is located in a tropical region known as a country that is very suitable as a place to grow a variety of plants such as fruits and vegetables that have many benefits. Indonesia has various kinds of tubers, including onion bulbs (*Allium ascalonicum*), garlic bulbs (*Allium sativum* Linn.), Ants tuber (*Hydnophytum moseleyanum* Becc.), and Dayak onions (*Eleutherine palmifolia* Merr.) (Hakim, 2010; Nathasa, 2012; Nurwantoro *et al.*, 2012; Hidayah, *et al.*, 2015).

Foods contain antioxidants are highly recommended to maintain immune function to reduce the risk of cardiovascular disease (Thomas *et al.*, 2010). The usage of spices provides many benefits in daily life as smell, taste, and can also be used as herbal medicine. This is because they have antioxidant content (Hakim *et al.* 2015). Antioxidants are compounds that can prevent, delay and eliminate oxidative damage to target molecules, such as fat, protein, and DNA (Purwaningsih, 2012; Yeo *et al.*, 2015). Antioxidants can be natural and synthetic. For the addition of synthetic antioxidants must be limited and more recommended to use natural antioxidants, Because the addition of synthetic antioxidants can be carcinogenic.

Nowadays, the community especially the population of Kalimantan has been using a natural product for coloring a spice from generation to the generation. This product can also be herbal traditional, because of the complex nutrient content. It can prevalence several kinds of diseases. One of natural product used by the community Dayak onion. Dayak onion bulbs contain phytochemical compounds including alkaloids, glycosides, flavonoids, phenolic, quinone, steroids, tannins, and essential oils. The leaves and roots contain flavonoid and polyphenols (Puspadewi, 2013).

Generally, many Dayak onions are consumed as herbal medicinal plants, because they have properties as anticancer, diabetes mellitus, coronary heart disease, bronchitis, gout, hypertension, and many other diseases. Dayak onions are generally consumed in dry form or powder for boiling and drinking water (Fawwaz, 2015). Dr. Sukrasno stated that the anthocyanin content in dayak onion is high so that it can be used as a natural dye. The colour of dayak onion is red (Utami et al. 2013).

Dayak onion bulbs (*Eleutherine palmifolia Merr.*) have very good nutritional value and benefits, but it's still not widely known by the public. The composition of fresh Dayak onion/100-gram onion bulb was 70.65 g water content, 4.79 g ash content, 3.70 g protein content, 4.67 g fat content, and 86.20 g carbohydrate. Carbohydrate and protein content found in plants has an important role because it can provide nutritional value in food (Nur, 2011).

The previous research showed the protein content in Dayak onions was not damaged by heating. The high value of carbohydrates found in onion Dayak tubers in all samples because Dayak onion plants have glucose as an energy source (Nur, 2011). So the Dayak onion can be substituted as a functional food and nutrient-rich food. It has strong antioxidant activity with an IC50 value of 25.34  $\mu$  / ml (Kuntorin, 2010).

At this time there are many processed foods made from fish, one of them is nugget fish. Fish nugget is generally similar to a chicken nugget. The difference is the raw material used (Aswar, 2005). Freshwater fish

chosen as the main raw material in making fish nuggets are catfish. Catfish is very easy to get in the community and has been widely used as the main ingredient in various types of food. Characteristic of catfish is white flesh and are a good texture, so catfish is a good material to be processed as a basic ingredient in food processing (Arifin, 2003).

Catfish is a commodity of freshwater fish that is very easy to find. Catfish have several advantages including rapid growth, being able to adapt to the environment well, tastes good, high nutritional composition and the price is relatively low. The nutritional composition includes 17.7% protein content, 4.8% fat, 1.2% mineral, and 76% water (Astawan, 2008).

Catfish have advantages compared to other animal products. Leucine is an essential amino acid that has an important role in children's growth and in maintaining nitrogen balance. It also plays a role in the reformation and formation of muscle proteins (Zaki, 2009).

However, the level of fish consumption in Indonesia is still relatively low. According to data from the Ministry of Maritime Affairs and Fisheries (2017) the level of national fish consumption in 2014 reached 38.14 kg/capita/ year, in 2015 it reached 41.11 kg/capita/ year, in 2016 it reached 43.94 kg/capita/year, while in 2017 the average national per capita fish consumption in 2017 it was 46.49 kg/capita. The target of fish consumption in 2018 is 50,8 kg/ capita / year. While catfish production seen from the data on the development of national production in 2017 has always increased. In 2017 catfish production reached 1,77 million tons or an increase of 131 % compered to the data 2016 which reached 764, 797 tons.

Processing of catfish that is less varied tends to make this product less favored by the community. It is essential to increase awareness of fish consumption in the community, especially children who are still in the period of growth and development. It is important to study processing, so in this study, catfish are made in the form of catfish nuggets. Fish nuggets have advantages compared to other fish processed products because the nugget is no longer found in thorns which is an obstacle in consuming fish and its

shape which becomes attractive because it is coated with flour (Suhartini and Hidayat, 2005).

There are several benefits in the content of catfish and Dayak onions that are not yet known by the public. By conducting the research, and it can provide information about characteristic of catfish nugget which is added or substitution with Dayak onion extract. Furthermore, this study aims to analyze the effect of differences in concentration of Dayak onions addition on macronutrients, Alkaloid and organoleptic properties of catfish nuggets.

## **1.2. Formulation of Research Problem**

With the background mentioned, the problem can be formulated as follows:

- a. Is there any difference of Dayak Onion Extract (*Eleutherine palmifolia Merr.*) addition on macronutrient of catfish nugget?
- b. Is there any difference of Dayak Onion Extract (*Eleutherine palmifolia Merr.*) addition on alkaloid of catfish nugget?
- c. Is there any difference of Dayak Onion Extract (*Eleutherine palmifolia Merr.*) addition on organoleptic properties of catfish nugget?

## **1.3. Objective of Research**

### **1.3.1. General Objective**

Based on the background mentioned above, the general objectives of the research is to analyse the difference of Dayak onion extract (*Eleutherine palmifolia merr.*) addition on macronutrient, alkaloid and organoleptic properties of catfish nugget.

### **1.3.2. Specific Objective**

The specific objectives of this research are to :

- a. Know the difference of Dayak Onion Extract (*Eleutherine palmifolia Merr.*) addition on macronutrient of catfish nugget.
- b. Know the difference of Dayak Onion Extract (*Eleutherine palmifolia Merr.*) addition on alkaloid of catfish nugget.

- c. Know the difference of Dayak Onion Extract (*Eleutherine palmifolia Merr.*) addition on organoleptic properties of catfish nugget.

#### 1.4. Benefits of Research

##### 1.4.1. For Theoretical

The results of this research are expected to be a science and reference material as well as scientific information that is useful in the development of food science and technology especially in enriching macronutrient and alkaloid in processed catfish nugget products.

##### 1.3.2. For Practical

Can provide information or knowledge about some of the benefits of Dayak onions (*Eleutherine palmifolia Merr.*) In the food production, especially in the catfish nuggets production that are beneficial to health. But the addition of Dayak onion extract cannot be applied to any product, because Dayak onion had a bitter taste. So it less suitable for food products. And also to Provide information about variations of catfish that can be used as catfish nugget.

#### 1.5. Authenticity and Formers Research

Table 1. Authenticity and Formers Research

No	Research	Metode	Result of Research	Differences in Research
1	A.Ismanto, D. Arsanto and Suhardi (2014) Effect of Addition Different Concentrations Tiwai Onion Extract ( <i>Eleutherine Americana Merr</i> ) to Chemical	Proximate method, electrode glass pH, Titrimetric for vitamin C, and Bouton method for cooking shrinkage test.	The result showed that the addition of TOE up to 15 % affected significantly on water, fat, ash and vitamin C content (P<0.05). The addition of TOE up to 15 % increasing water, fat, ash and vitamin C content. Organoleptic	Ismanto's research was carried out on the study of chemical composition, physical quality, organoleptic and vitamin C in Arabian chicken nuggets.

No	Research	Metode	Result of Research	Differences in Research
	Composition, Physical, Organoleptical Quality, and Vitamin C of Gallus turcicus Meat Nugget		quality taste, flavor, texture, and tenderness increased but the color was decreased compared to control. Nugget by addition EBT up to 15 % still acceptable for panelis.	Variable in this research was analyzed using proximate test, alkaloid test, and organoleptic properties.
2	Suroto, H. S. (2018) Dayak onion ( <i>Eleutherine palmifolia Merr</i> ) as a preservative, antioxidant and coloring agent for food.	DPPH method (spectrophotometry UV-Vis)	The result showed that tiwai onion has the potential to be applied as food preservatives, antioxidants, and coloring agents.	In the Suroto study, Dayak onions have the potential for food additives such as used as preservatives, antioxidants and natural dyes for food.  Variable in this research was analyzed using proximate test, alkaloid test, and organoleptic properties.
3	Sajidah, (2018) Effect of Giving Dayak Onion ( <i>Eleutherine Americana Merr</i> ) Extract on Flavonoid Compounds and Antioxidant Activity of Tempeh Nugget	Masserasi method for extract, and spectrophotometry UV-Vis for antioxidant activity	The result showed that content of antioxidant activity in nugget tempe products substituted with 15% dayak onion extract had IC50 66,826 µg / ml, so the reduction of free radicals was getting better.	The analysis carried in Sajidah's research was to examine flavonoids, isoflavonoids and antioxidant activity in nugget tempeh.  Variable in this research was analyzed using proximate test, alkaloid test, and organoleptic properties.