

CHAPTER 1

INTRODUCTION

1.1. Background of Study

Currently, Indonesian traditional medicine in community is growing. Most of the Indonesian people are interested in treating the diseases they suffer from traditional medicine from various Indonesian plants (Kusuma *et al.*, 2016). One of them is Dayak onion (*Eleutherine americana* Merr.) Plants that are on this earth created by Allah SWT have several benefits that can be used for His creatures. As mentioned in the Qur'an Surah *Thaha* verse 53:

الَّذِي جَعَلَ لَكُمُ الْأَرْضَ مَهْدًا وَ سَلَكَ لَكُمْ فِيهَا سُبُلًا وَأَنْزَلَ مِنَ السَّمَاءِ مَاءً
فَأَخْرَجْنَا بِهِ أَزْوَاجًا مِنْ نَبَاتٍ شَتَّى

Means: “ He who has made for you the earth like a carpet spread out, has enabled you to go about therein by roads and has sent down water from the sky. With it have, We produced diverse pairs of plants each separate from the others”.

Allah SWT has created the rain and from which grow various kinds of plants. At *Lafadz نَبَاتٍ شَتَّى* has the meaning that plants created consist of various types, shapes, colors, flavors, and benefits. One of the various beneficial plants is Dayak onion (Galingging, 2009).

Dayak onion (*Eleutherine americana* Merr.) which has efficacy as antiacne (Syamsul *et al.*, 2015), antifungals (Diana *et al.*, 2014), antioxidants (Kuntorini *et al.*, 2016) anticancer, anti-inflammatory, antitumor, and prevent heart disease (Firdaus, 2014). The research conducted by Febrinda (2014) showed that onion extract had antioxidant compounds including triterpenoids, flavonoids, phenolics, alkaloid, and tannins.

Dayak onion is believed to contain various active compounds that are effective in treating various diseases (Kuntorini, 2013). The results of Firdaus's research (2014) proved that Dayak onion extract could inhibit *Staphylococcus aureus* bacteria. Dayak onion could also inhibit the growth of *Staphylococcus epidermis* and *Candida albicans* bacteria in vitro (Yuniarsih, 2018). Dayak onion extract with ethanol 96% solvent could inhibit the growth of *Escherichia coli* bacteria by using the disc diffusion method (Amanda, 2014). Furthermore, degenerative diseases (obesity, diabetes, coronary disease, and cancer) are currently increasing in prevalence, thus increasing people's desire for healthy living. Healthy living can be regulated by regulating diet and increasing people's demand for functional food (Suter, 2013).

Functional food is a food product comprising an active component that may provide health benefits and can be consumed without a certain dose (Astawan, 2011). The role of functional food for the body rests on the nutritional and non-nutritional components contained in it. These components are generally in the form of active components whose existence in food can occur naturally, due to the addition from outside, or processing (Suter, 2013). Bioactive components in functional food are responsible for ongoing metabolic reactions to health benefits (Subroto, 2008) such as carotenoids, dietary fiber, fatty acids, flavonoids, minerals, phenolic acids, and vitamins (Blasa *et al.*, 2010).

According to Marsono (2008), functional food products have high prospects including products that are lots of nutrition. Fisheries functional product development has also been carried out, for example the addition of seaweed for optimal texture the results of cork fish nugget (Masita, 2015), utilization of carrots as protein additions to cork fish nugget (Yulianti, 2018), and making catfish nugget with addition of mustard greens to improve nutrient quality (Cahya, 2018). Nuggets is mostly made from chicken, beef, and fish. The price of chicken and beef which is expensive raw material makes it impossible for everyone to enjoy it (Prastia *et al.*, 2016).

In 2013-2014 based on FAO data (2016), Indonesia was ranked 7th for aquaculture production in the world. When compared with the conditions for 2011-2012, Indonesia had a decline which previously Indonesia was in 4th position. According to Nurjannah (2015), Indonesia community had a low level of fish consumption. The low consumption of fish is inversely proportional to the region which is a lot of animal protein sources. Data from the Ministry of Maritime Affairs and Fisheries (MAF) stated that in the range of 2010-2014, fish consumption was always below the existing fish stocks. The average consumption rate was below 38 kilograms per capita, while the supply figure could range between 38 and 51 kilograms per capita (Maritime Affairs and Fisheries, 2017).

In East Java, Tulungagung Regency is the largest producer of catfish, which is 13,274.0 tons with a percentage of production of 31.35% (Data Center, Statistics and Information, 2013). Fish is a source of omega-3 which is very good for human health (Musbah *et al.*, 2017). The protein and fat content in fish is beneficial especially for children's growth and development. Catfish is a type of fish that can be consumed by all age groups (Hendriana, 2010). Yuliasri & Suwandi (2015) explained that catfish had a fairly high protein content (17,7-26,7%) and fat (0,95 – 11,5%). The advantages of catfish compared to other animal products are lots of leucine and lysine which is needed for children's growth and development. Leucine is an essential amino acid that is very necessary for the reformation and formation of muscle proteins. Lysine is needed for tissues growth and repair (Arvianto, *et al.*, 2016). The development research of catfish products into nugget products, especially functional nugget using Dayak onions has never been reported. This research is intended to analyze the effect of differences in concentration on flavonoid content, antioxidant activity, and organoleptic of catfish nugget by the addition of Dayak onions contained there in.

1.2. Formulation of the Problem

- a. What is the effect of Dayak onion extract (*Eleutherine americana* Merr.) addition on catfish nugget to flavonoid content?
- b. What is the effect of Dayak onion extract (*Eleutherine americana* Merr.) addition on catfish nugget to antioxidant activity?
- c. What is the effect of Dayak onion extract (*Eleutherine americana* Merr.) addition on catfish nugget to organoleptic properties?

1.3. Objective of the Research

1.3.1. General Objective

The general objective of the research is to know the effect of Dayak onion extract (*Eleutherine americana* Merr.) addition on catfish nugget to flavonoid content, antioxidant activity, and organoleptic properties.

1.3.2. Specific Objective

Specific objectives of the research are to :

- a. Know the effect of addition Dayak onion (*Eleutherine americana* Merr.) extract on catfish nugget to flavonoid content
- b. Know the effect of addition Dayak onion extract (*Eleutherine americana* Merr.) on catfish nugget to antioxidant activity
- c. Know the effect of addition Dayak onion (*Eleutherine americana* Merr.) extract on catfish nugget to organoleptic properties

1.4. Benefits of Research

1.4.1. Theoretical Benefit

Theoretical benefit of the research are to :

- a. Provide information about the health benefits of adding Dayak Onions in making catfish nugget.
- b. Provide scientific information on food technology.
- c. Implement and utilize the knowledge gained during education.

1.4.2. Practical Benefit

Practical benefit of the research are to :

- a. Increase knowledge about the development of research into the addition of Dayak onion extract to catfish nugget.
- b. Reference material for practitioners interested in food technology.

1.5. Previous Research

Several studies have been conducted by Cahya (2018) on Diversifying Fish Nugget Using Catfish and Adding Green Mustard (*Brassica rapa Var. Parachinensis*). However, research on the effect of addition Dayak onion extract (*Eleutherine americana* Merr.) of catfish nugget to flavonoid content, antioxidant activity, and organoleptic has never been reported. The difference in this research with previous research regarding the manufacture of the fish nugget is in table 1.

Table 1. Authenticity of the research

| Researcher | Title | Result and Method | Differences |
|------------------------|---|---|--|
| Fahma Dwi Cahya (2018) | Diversification of Fish Nugget Using Catfish and Addition of Green Mustard (<i>Brassica Rapa Var. Parachinensis</i>). | There was a different effect of the addition of green mustard on African catfish nuggets to the hedonic test and hedonic quality test Methode: experimental method with Completely Randomized Design (CRD) | The analysis conducted by Fahma's research is the hedonic test and hedonic quality test In this study, the effect of Dayak onion extract of catfish nugget to flavonoid content and antioxidant activity and organoleptic properties. |

| Researcher | Title | Result and Method | Differences |
|---|---|--|--|
| Viqi Sajidah (2018) | Effect of Addition of Dayak Onion Extract (<i>Eleutherine americana</i> Merr.) On Flavonoids and Antioxidant Activities and Tempe Nugget | There was no difference in the total levels of flavonoids in tempeh nuggets with the addition of Dayak onion extract and differences in anti-oxidant activity on tempe nuggets with the addition of Dayak onion extract. Methode: experimental method with Completely Randomized Design (CRD) | The analysis carried out was the addition of Dayak Onion Extract (<i>Eleutherine americana</i> Merr.) To Flavonoids and Antioxidant Activities on Tempe Nugget In this study, the effect of Dayak onion extract on catfish nugget on flavonoid, antioxidant and organoleptic properties. |
| Widya Areta Humaniora Jutisia dan Anni Catur Adi (2016) | Increased Acceptability and Protein Nugget Levels Substitution of Catfish (<i>Clarias batrachus</i>) and Red Beans (<i>Vigna angularis</i>) | The substitution of catfish and red beans has an effect on the acceptability of nuggets with the best composition is the formula of nuggets catfish is 88 g, red beans 65 g, and 10 tapioca flour g. Methode: experimental method with Completely Randomized Design (CRD) | Analysis carried out by substitution nuggets of catfish (<i>Clarias batrachus</i>) and red beans (<i>Vigna angularis</i>) can increase acceptability and protein content in nuggets In this study, the effect of Dayak onion extract on catfish nugget on flavonoid, antioxidant and organoleptic properties. |

| Researcher | Title | Result and Method | Differences |
|--|--|--|--|
| A Ismanto, D Arsanto, dan Suhardi (2014) | Effect of Addition of Tiwai Onion Extract (<i>Eleutherine americana Merr</i>) on Chemical Composition, Physical Quality, Organoleptic and Vitamin C Arab Chicken Nuggets (<i>Gallus turcicus</i>) | Addition of Tiwai onion extract (<i>Eleutherine americana Merr</i>) could increase water content, fat content, ash content, and vitamin C but reduce the quality of organoleptic colors and does not affect the acceptability of chicken nuggets. Methode: experimental method with Completely Randomized Design (CRD) | Effect of addition of Tiwai onion extract (<i>Eleutherine americana Merr</i>) on chemical composition, physical quality, organoleptic and vitamin c arab chicken nuggets (<i>Gallus turcicus</i>) In this study, the effect of Dayak onion extract on catfish nugget on flavonoid, antioxidant and organoleptic properties. |