

CHAPTER I INTRODUCTION

1.1 Background

Red snapper (*Lutjanus bitaeniatus*) is one type of demersal fish that has high economic value. Red snapper is a type of demersal fish from the family of Lutjanidae that has important economic value in Indonesia (Marzuki and Djamal, 1992). Red snapper contributes 8.2% to the Indonesian economy. Indonesia is also the main producer of red snapper which is equal to 84%. This fish is one of the main commodities of marine fisheries in the Lamongan and Probolinggo regions (Kementerian Perikanan dan Kelautan, 2017). Red snapper is a fish with the high economic value that vulnerable by parasitic disease.

Metazoans parasite are organisms that live on or inside other organisms, take food from the organism in to breed (Subekti and Mahasri, 2010). Metazoans that can infect red snapper are from Nematode and Trematode phylum can cause a zoonotic disease. The presence of metazoans in the body of the fish can reduce the quality and economic value of red snapper (Muttaqin and Abdulgani, 2013). This makes red snapper unhygienic and sterile, as well as reducing eligibility for consumption, because fish are exposed to anisakiasis which makes it allergen when the worm is still alive eaten by humans.

Zoonotic disease of the Nematodes phylum that occurs due to transmission from fish is one of them Anisakiasis. Anisakiasis is a zoonotic disease caused by endoparasitic worms, in Indonesia Anisakiasis case was reported in Sidoarjo, East Java in 1996 (Muttaqin and Abdulgani, 2013). Worm species that cause anisakiasis

are from the Anisakidae (Alim, 2018). According to Grabda (1991) Anisakis larvae when in the human intestine will penetrate the intestinal mucosa and submucosa and cause extensive wounds. Clinical symptoms are not specific, can occur 4 hours after consuming fish and are generally seen within 24 hours such as abdominal pain, diarrhea, fever and vomiting. In acute cases gastritis can occur in the digestive tract.

Trematodes phylum also cause the disease in red snapper, according to Yamaguti (1958) Pseudosteringophorus worms founded in the body of red snapper in their nature habitat. Pseudometadena is found in the intestine of red snapper in Indonesia waters (Subekti and Mahasri, 2010).

The diseases appear caused by metazoans parasite in red snapper can influence in the host body. Based on the things that have been stated, the researcher want to conduct a research related to the parasitological index and the correlation with the physical parameters in red snapper (*Lutjanus bitaeniatus*) captured in East Java waters.

1.2 Formulation of the Problem

Is there any correlations between physical parameters and parasitological index of Metazoan from red snapper (*Lutjanus bitaeniatus*) in East Java?

1.3 Research Purpose

Analyze the correlation between physical parameters and parasitological index of metazoan from red snapper (*Lutjanus bitaeniatus*) in East Java.

1.4 Benefits of Research

1.4.1 Theoretical benefit

The benefits of the results this research were to contribute data on the presence of infections and parasitological index in red snapper taken from East Java. The results of the data from this research also can be used as insight or information and literature for further research on about diseases caused by parasitic agent, especially in East Java, Indonesia.

1.4.2 Practical benefit

The practical benefit of this research is to provide insight and information to the general public (common people) regarding the physical parameters of red snapper (*Lutjanus bitaeniatus*) and the degree of metazoan infection that has the correlation.

1.5 Theoretical Basis

Factors that affect the number, size, behavior of each parasite in the host includes age, host body size, climate, season, and geographic location. Larger fish have more food supplies so there is almost no competition for parasites over food. Lack of competition among parasites in the environment causes the number of *Anisakis* sp. in larger fish will increase (Noble and Noble, 1989).

Larger fish have a longer life span so that the chance of being exposed by worm larvae *Anisakis* sp. also higher during life (Hadidjaja *et al.*, 1978). Mouth diameter describe the largest size of food that can be swallowed by fish or

ontogenetically, the larger the size of the fish, the greater the size of food that can be swallowed (Kamal *et al.*, 2006).

Existence of *Anisakis* sp. in the body of the fish is influenced by several factors, namely fish age, fish length, and geographic location. Parasitic attacks are more common in adult fish because they accumulate more parasites. Furthermore, Klimpel *et al.*, (2004) also stated that the increase in fish body length resulted in higher parasite accumulation of host life cycles due to the increase in the number and type of food in larger fish.

According to Palm *et al.*, (2008) many of third-stage larvae (L3) *Anisakis* were influenced by feeding habits, microhabitat, fish species and the condition of the waters of an area that could influence the prevalence and intensity of parasites. Parasitic microhabitat is an environment or residence that supports parasitic life including food availability, oxygen, and competition between species (William and Jhon, 1993).

Some factors such as diet, age, fish length, and season directly influence present parasite in the host (Ravi and Yahaya, 2015). The parasitic interaction in various trophic levels, food webs, competition and biodiversity around them helps to shape their community structure (Verma and Capoor, 2013). Some studies also stated that there is a relationship between the total length of fish and the level of parasitic infection in some hosts (Valero *et al.*, 2006).

The research conducted by Muttaqin and Abdulgani (2013) at the Lamongan Brondong Fish Auction Place shows the prevalence of *Anisakis* sp. larvae. in red

snapper (*Lutjanus* sp.) measuring 25-37 cm reaching 80% with infection rates of 18.25 parasites in fish. Research according to Anggraeni (2014) prevalence of red snapper infected with *Anisakis* sp. taken from Lamongan Brondong Fish Auction Place is 11.67%.

1.6 Hypothesis

There is any correlation between physical parameters and parasitological index of Metazoan from red snapper (*Lutjanus bitaeniatus*) in East Java.