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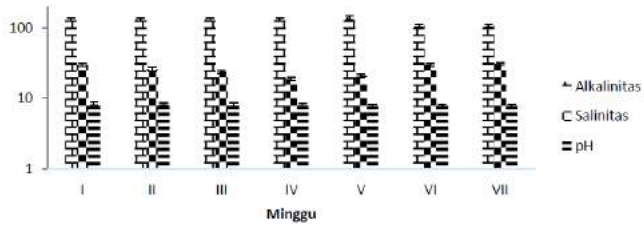

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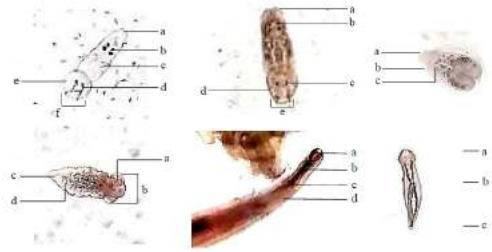

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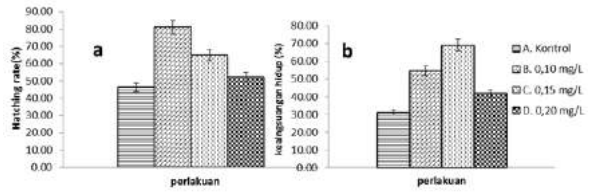

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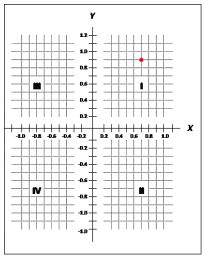

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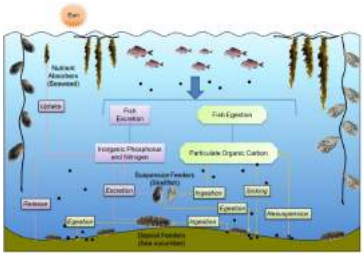

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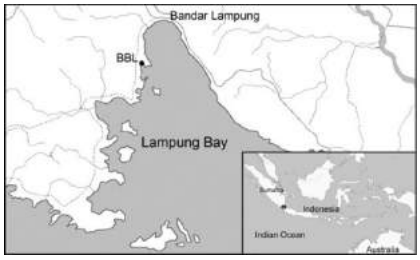

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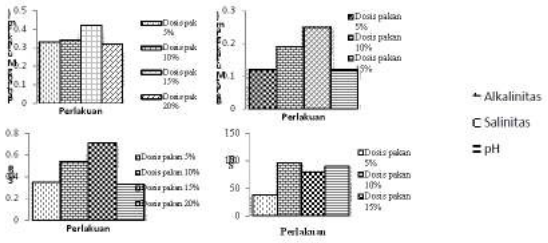

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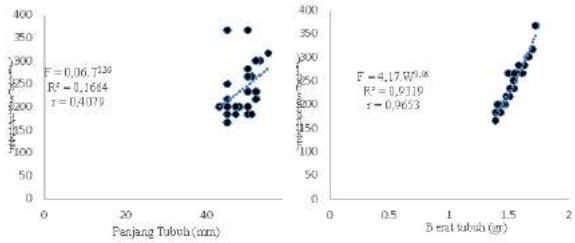

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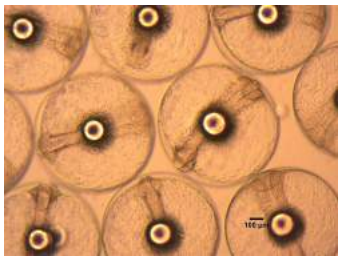

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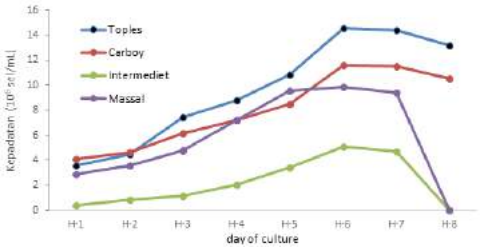

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		Range	Range
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Salinity (%)	33-34*	32-33	31-33
pH	7-8.5*	7-8.5	7-9
Ammonia(mg/l)	0.3*	0.044-0.22	0.02-1.1
Dissolved Oxygen (DO) (mg/l)	>5*	6-8.37	5-10

Note: *Decree of the Minister of the Environment Number 51 of 2004

The Prevalence and Intensity of Neobenedenia girellae in Barramundi (Lates calcarifer) in Lampung and Situbondo Waters

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The Prevalence and Intensity of *Neobenedenia girellae* in Barramundi (*Lates calcarifer*) in Lampung and Situbondo Waters

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Abstract

Barramundi *(Lates calcarifer)* is a fish that has high economic value and has the potential to be developed in Indonesia. One of the species reported to barramundi is infest *Neobenedenia girellae.* This study aims to determine the prevalence and intensity of the parasitic worm *Neobenedenia girellae* in barramundi in the waters of Lampung and Situbondo. Sampling of barramundi with a size of 21 - 30 cm as many as 40 fish from Lampung waters and 50 barramundi from Situbondo waters. The results showed that there was worm infestation *Neobenedenia girellae* on barramundi in the waters of Lampung and Situbondo. The prevalence value of *Neobenedenia girellae* in barramundi in Lampung waters is 92% with almost always category and intensity value of 1.37 with low category when in Situbondo waters the prevalence value is 92% with almost always category and the intensity value is 1.67 with low category.

Keywords: *Lates calcarifer*, Intensity, Prevalence, *Neobenedenia girellae*

INTRODUCTION

Barramundi (*Lates calcarifer*) is one of the economically important fish that has the potential to be cultivated due to its relatively fast growth, easy adaptation to the cultivation environment, and a large enough market share for both domestic and export needs. The high demand for barramundi commodities has resulted in intensive exploitation (fishing), so their availability in nature decreases. Constraints that are often encountered in carrying out cultivation activities are infectious diseases which are usually caused by an imbalance of interactions between environmental factors, hosts, and disease agents.

This disease arises due to disturbances in fish metabolism by foreign organisms, be it viruses, bacteria, or parasites (Muttaqin and Abdulgani, 2013). Ectoparasites are parasites that live on the outside of the host's body, endoparasites are parasites that live inside the host's body. Meanwhile, mesoparasites are parasites that are partly endoparasites and ectoparasites (Subekti and Mahasri, 2016). Previous research has been conducted by Putri et al. (2020) with the result that the prevalence of *Neobenedenia girellae* on cobia (*Rachycentron canadum*) in Hurun Bay, Lampung is 65%.

Data on the distribution of diseases in marine fish farming in 2019 in Lampung waters showed that many

barramundi (*Lates calcarifer*) were infested with parasitic worms of the *Neobenedenia* genus. *Neobenedenia girellae* is a parasite that infests the body surface of marine fish (epidermis, eyes, and fins). Fish that are infected with ectoparasites on their skin will rub their bodies on the objects around them so that they often cause new wounds that can lead to secondary infection (Wiyatno et al., 2012).

MATERIAL AND METHODS

Research time and place

This research was carried out in May - December 2019. Sampling was carried out at the Floating Net Cage for Barramundi from Lampung and Situbondo waters. Observations and identification of parasites were carried out at the Fish Health and Environmental Laboratory of the Center for Marine Aquaculture (BBPBL) Lampung and the Center for Brackish Water Aquaculture (BPBAP) Situbondo.

Tools and materials

The tools used include a glass object, a set of surgical instruments (dissecting set), digital scales, a ruler, a binocular microscope, label paper. The materials used in this study were 5% alcohol glycerin, distilled water, physiological solution.

Sampling

Total 90 fish samples were colected from two site reseach (40 fishes taken from BBPBL Lampung and BPBAP Situbondo 50 fish) with a size of 21-30 cm. Fish sampling was following the standards set by the Hang Nadim Batam Class I Fish Quarantine Station (2010), which stated that fish samples were taken for 5-10% of the total fish population, in addition to fish samples, water quality samples were taken which included pH, DO, temperature, ammonia content, and salinity.

Prevalency and Intensity

Examination of the *Neobenedenia girellae* worm was carried out by surgically removing the fish on the gill organs of the barramundi. The gills that have been taken and removed using tweezers are then placed in an object-glass with added physiological saline solution. Observations of *Neobenedenia girellae* worms were carried out using a binocular microscope, then the prevalence and intensity values were calculated and categorized based on the level (William and William, 1996). The formula used in the calculation of prevalence and intensity based on Kabata (1985) is as follows:

$$\text{prevalence} = \frac{\text{number of parasites found}}{\text{number of fish infested}} \text{x}100\%$$

$$\text{intensity} = \frac{\text{total of parasites infested}}{\text{number of fish samples}}$$

Water Quality Measurement

The water quality measured was temperature using a mercury thermometer, dissolved oxygen was measured using the Winkler titration method, acidity (pH) using a pH meter, ammonia content (NH_3) was measured using a sera ammonia tester, and salinity using refractometer. Measurements were made at the time of

sampling of barramundi in the floating net cage, namely in the morning at 08.00 - 09.00 WIB.

Data analysis

The data obtained were processed descriptively and in tabular form. Furthermore, the data were analyzed descriptively using relevant references and compared with previous similar studies to find out the differences and their effectiveness.

RESULTS AND DISCUSSION

Based on the research conducted, it was found that *Neobenedenia girellae* worm infestation was found on the gills of barramundi (*Lates calcarifer*) in the waters of Lampung and Situbondo. The results of the calculation show that the prevalence value in Lampung waters is 95% with the category almost always and the intensity value obtained is 1.37 individuals/head with the low category. Several cases of prevalence cultured fish in Lampung bay have high a result, such as; the prevalence of *Pseudorhabdosynochus coioidesisin* in humpback grouper it was 93% (Ardiyanti et.al, 2022). Meanwhile, the prevalence of star pomfret *Pyragraphorus hollisaein* (Trachinotus blochii) in these waters is 86.7% (Akbar et.al, 2022). In other hand, the prevalence in Situbondo waters was 92%, these almost always category and the intensity value obtained is 1.67% in the low category. Meanwhile, prevalence of *Pseudorhabdosynochus coioidesisin* in humpback Situbondo waters was 95% (Ardiyanti et. al, 2022). The results of the calculation of the prevalence and intensity values (Table 1).

Table 1. Prevalence value and intensity of *Neobenedenia girellae* in Lampung and Situbondo waters.

Location	Number of Samples	Infected Sample	Prevalence (Category)	Intensity (Category)
Lampung waters	40	38	95% (Almost always)	1.37 (Low)
Situbondo Waters	50	46	92% (Almost always)	1.67 (Low)

Table 1 shows a high prevalence value. According to Wiyatno et al. 2012, the management of fish rearing is not good, such as the lack of good control of water quality, and the cleanliness of the nets in the cultivation process is the cause of the high prevalence value. In addition, there is an influence of the climate which causes fish to be weak and susceptible to disease and disturbances in fish physiology. Currents in the waters are also one of the factors that affect the presence of worm infestations. According to Yuliartati (2011), the factors that influence the prevalence value are the size of the host, the larger or heavier the host, the higher the parasitic infection. The host body is a place for parasite colonization. The more surface area of the fish body, the parasite colony also increases, so the

prevalence and intensity of parasites increase (Alifuddin et al., 2003). Measurement of water quality in floating net cages from these sites were presented in (Table 2).

Table 2. Water Quality Parameters During Research

Parameter	Quality standards	Lampung Waters	Situbondo Waters
		Range	Range
Temperature (C)	28-30*	29-30	28-33
Salinity (%)	33-34*	32-33	31-33
pH	7-8.5*	7-8.5	7-9
Ammonia(mg/l)	0.3*	0.044-0.22	0.02-1.1
Dissolved Oxygen (DO) (mg/l)	>5*	6-8.37	5-10

Note: *Decree of the Minister of the Environment Number 51 of 2004

The results of temperature measurements in these waters are normal categories for the maintenance of cultured fish. Temperature is one of the most influential factors in cultivation and is an important thing in regulating the life processes of organisms. High temperatures will reduce the dissolved oxygen. This is following Mahasari et al., (2009) who states that water temperature can affect fish life, because the higher the temperature, the lower the dissolved oxygen. At the same time, an increase in temperature also increases the metabolic activity of aquatic organisms so that the need for oxygen will also increase, so the temperature also affects the reproduction process of parasites, high temperatures will cause an increase in parasites.

Lampung and Situbondo waters are examples of waters that have high activity because around the environment besides cultivation activities there are tourist attractions that can cause uncontrolled waste production. This causes an increase in the pH value. The waste or garbage produced contains various kinds of chemical compounds, such as detergent discharge, which can affect the pH value of the waters (Jaya, 2011).

CONCLUSION

Based on the research that has been done, it can be concluded that the prevalence rate of the parasite *Neobenedenia girellae* in barramundi in Lampung waters is 95% and 92% in Situbondo waters, as well as the intensity value obtained in Lampung waters is 1.37 individuals/head and Situbondo waters are 1.67%, from these results it can be categorized that *Neobenedenia girellae* worms almost always attack barramundi (*Lates calcarifer*).

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