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Intensity and Prevalence *Trichodina* sp. on Tilapia Fish Seeds *(Oreochromis niloticus)* at the Jatiwangi Cultivation Pond, Majalengka

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ABSTRACT

The aim of this research is to determine the intensity and prevalence values of *Trichodina* sp., using the scrapping method. Time and location of research from May to June 2024 at the Aquaculture Laboratory of the Faculty of Fisheries and Marine Sciences, Universitas Padjadjaran and the Parasitology Laboratory at the Cirebon Marine and Fishery Products Quality Control and Supervision Agency (BPPMHKP). Exploratory- descriptive research method. Morphological identification using random sampling is identified microscopically. The results of the research obtained an intensity value of 31.8 individuals/head. Meanwhile, the prevalence value was 79.16%. There are 5 species of *Trichodina* sp. found were *Trichodina acuta*, *Trichodina heterodentata*, *Trichodina nobilis*, *Trichodina reticulata*, and *Trichodina nigra*.

INTRODUCTION

Tilapia is a species of freshwater fish originating from the Nile River in africa (Rahmi 2017). Tilapia fish has a high protein cintent (17,7%) and low-fat content (1,3%) (Putra *et al.,* 2017). This makes tilapia fish popular with the public because apart from its economical price, it also has delicious and tasty meat.

According to Delima *et al.,* (2017) states that the market prospects for selling tilapia fish are quite high. Acording to KKP (2022), tilapia commodity production data in 2021 was 371,986 thousand fish, then experienced and increase in 2022 to 401,767 thousand fish. However, one of the things that makes it difficult to optimally fulfill consumer demand for tilapia is due to the emergence of diseases and parasites that attack the fish.

The emergence of parasites can cause a decrease in quality and decrease in fish production, causing a lethal effect on the host population and one of the consequences can cause large losses for the fishing industry and can also have an impact on the health of humans who consume them. Fish diseases can arise due to unsuitable pond pond waters (Misganaw dan Getu 2016).

Trichodina sp. including one of the most common pathogenic parasites found in freshwater and seawater fish. In freshwater fish, namely tilapia, *Trichodina* sp. usually infects the skin and causes gill damage which can cause death of the fish (Putra *et al.,* 2017). Early signs of infected fish *Trichodina* sp. shows a pale color, thin fins, reddish operculum cover, rubs the body agains the edge of the pool, causing skin irritation and hyperplasia of ephithelial cells which appears together with the proliferation of mucus cells which makes the fish weak and thin, then the fish will die. The disease caused *Trichodina* sp. named *Trichodiniasis* which spreads very quicly because it divides it self.

This study aims to analyze intensity and prevalence *Trichodina* sp. which attacked tilapia fry Jatiwangi cultivating pond, Majalengka Regency, West Java.

METHOD

This research was conducted in May-June 2024 at the Aquaculture Laboratory of the Faculty of Fisheries and Marine Sciences, Universitas Padjadjaran and the Parasitology Laboratory at the Cirebon Marine and Fishery Products Quality Control and Supervision Agency (BPPMKHP). The sampling location was Mr. Dadang Daryanto's tilapia cultivation pond, Leuweunggede Village, Jatiwangi District, Majalengka Regency, West Java.

The material used for research was tilapia fish seeds, physiological Nacl 0.9%. The tool used is a Zeis Primo Star microscope equipped with an application *motic image plus*2.0 *slide glass*, *cover glass*, *dissecting set*, *silver nitrate solution* (AgNO3) 2%, and entelan.

RESEARCH PROCEDURE

Sampling of Tilapia Fish Seeds

Data collection was carried out using descriptive methods, with the method of sampling tilapia seeds *(Oreochromis niloticus)* done randomly (random sampling). Fish sampling was carried out by direct fishing using net/ tanggok fishing gear at the cultivation location. The fish samples that have been obtained are then placed in plastic containing sufficient water from the location where the sample was caught.

The tilapia seed samples were then taken to the Parasitology Laboratory at the Cirebon Marine and Fishery Products Quality Control and Supervision Agency (BPPMKHP) for ecto parasite examination. Tilapia fish seeds were collected 3 times during 1 week with a break of 2 days. In the first sample, there were 18 fish, in the second sample there were 18 fish and in the third sample there were 16 tilapia fry. A total of 50 tilapia fish fry were observed.

Identification of Ectoparasites using Methods *Scrapping*

The tilapia seed samples that have been obtained are then scraped off the

fins, skin *(mucus),* and cut off the gill filaments and then placed inslide glass which had been added with 0.9% physiological NaCl and then observed using a microscopetrinocularalong with the measurements in the form of an application motic image plus 2.0 to determine the size of the species Trichodinasp. with magnifications of 40x, 100x, and 400x (Noga 2019). Next, coloring is done Trichodinasp. using silver nitrate (AgNO3) which is dripped with entelan and then covered withcover glass. Results of species observations *Trichodina* sp. those foundare recorded, counted and documented. Identification *Trichodina* sp. which was found following the guidelines written by Anshary (2016).

Coloring *Trichodina* sp.

According to Anshary (2016) coloring procedure *Trichodina* sp. using silver nitrate (AgNO3) is as follows:

1. Separating the parasite from its substrate. Air dry ± 5 minutes.
2. Flood the parasites with silver nitrate (AgNO3) 3-5 drops. Air dry ± 1-3 hours.
3. Rinse withaquadest.
4. Soakingslidesthose with parasites using distilled water petridishand dry inthe sun for about 3-4 hours.
5. After drying, rinse withaquadest to clean and dry, air dry for ± 5 minutes
6. Drop enough entelan (1-2 drops) and cover withcover glass

Pool Water Inspection

Checking pool water is by measuring temperature and pH. Water temperature measurements were carried out with a water thermometer inserted into the pool to a depth of 6 cm from the water level for 3 minutes, pH measurements with pH paper dipped in pool water for 2 minutes then the results were checked with the acidity degree (pH) indicator paper.

Data Analysis

Morphological results data *Trichodina* sp. identified using a Zeis Primo Star microscope equipped with an application motic image plus 2.0. Species data Trichodina sp. the analyzed descriptively by matching parasite literature and journals.

According to Maulana et al., (2017) calculation of prevalence and intensity values can be calculated using the following formula:

$$Prevalence\ (\%) = \frac{the\ number\ of\ fish\ infected\ with\ the\ desease}{number\ of\ fish\ examined} x100\%$$

$$Intensity\ (ind/ekor) = \frac{number\ of\ parasite\ found}{number\ of\ infected\ fish}$$

RESULT AND DISCUSSION

Clinical Symptoms of Tilapia Seeds Infected with *Trichodina* sp.

Observe clinical symptoms of infected fish attacked by Trichodina sp. Usually dangerous if left untreated due to excessive mucus production and weak appearance, thin fins and sores on the skin. Pramono and Hamdan (2019) stated that attacks Trichodina sp. with high intensity it will cause damage to the gill structure which makes it difficult for the fish to breathe that the fish will die. The appearance of clinical symptoms of tilapia fry who were attacked by the parasite Trichodina sp. show in Figure 1.

Figure 1. Clinical symptoms a) Thin fins, b) The body produces a lot of mucus excessive, c) *operculum* reddish, d) Gills pale and thin
Source: Personal Documentation (2024)

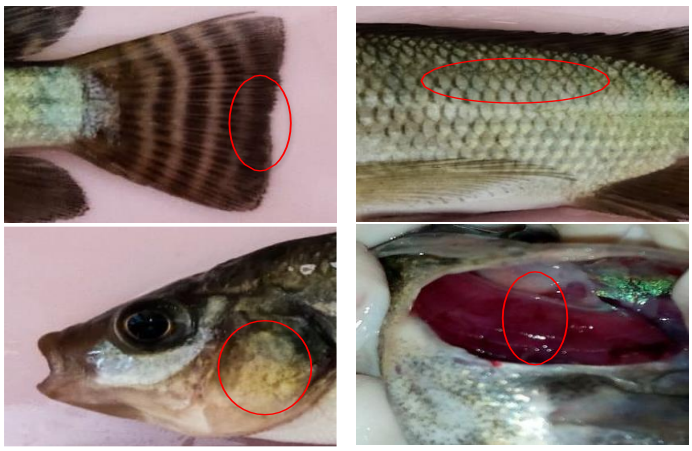

Figure 2. Clinical symptoms a) Thin fins, b) The body produces a lot of mucus excessive, c) *operculum* reddish, d) Gills pale and thin
Source: Personal Documentation (2024)

Based on Figure 1, it can be explained that of the 50-tilapia fry, there were 40 that had clinical symptoms of thin fins, a lot of excess mucus on their bodies, reddish

operculum cover, and pale red gills. Meanwhile, 10 tilapia fries were normal and had no indication of parasite attack *Trichodina* sp. shown in Figure 2.

As for the spread *Trichodina* sp. attacks on tilapia fry were observed using a Zeis Primo Star trinocular microscope with 40x dan 100x magnification shown in Figure 3.

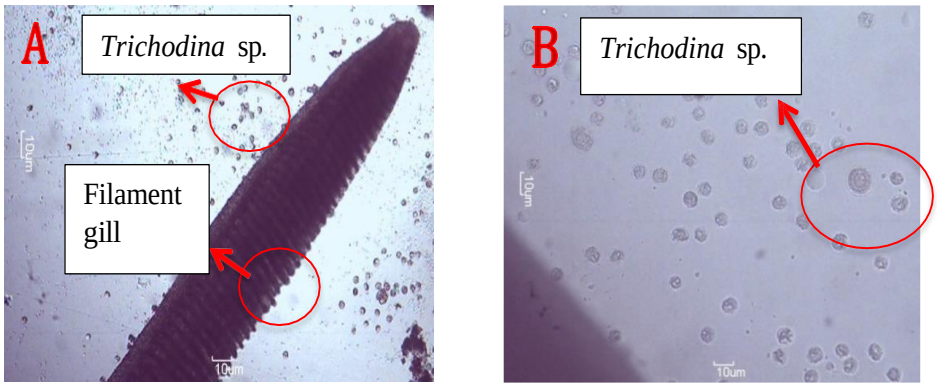

Figure 3. Spread *Trichodina* sp. a) on gill filaments 40x magnification b) on skin (mucus) 100x magnification
Source: Personal Documentation (2024)

Based on Figure 3 that attack *Trichodina* sp. There were a lot of tilapia fish attacks with a total of 1315 individuals *Trichodina* sp. from 50 samples of tilapia fry. If it is not treated immediately, over time the fish will die. According to Riko *et al.,* (2016) developments *Trichodina* sp. very fast because of its ability to divide binary and its spread is very wide and can infect freshwater fish in general. Transmission *Trichodina* sp. generally caused by poor pond maintenance techniques and water quality management, such as high stocking densities, quiet ponds, stagnant and no current. According to Zhella (2016) states that pools that are calm, stagnant and have no current allow infection Trichodinas higher than in a pool with a fast current.

Intensity and Prevalence *Trichodina* sp. Research Result

Result of intensity and prevalence research *Trichodina* sp. which infect tilapia fry can be seen in Table 1.

Table 1. Intensity dan Prevalence Data *Trichodina* sp. which Infectes Seeds Parrot Fish

Test	Sum fish	Seed Infected	Seed no infected	*Trichodina* sp. found	Intensity (individu /tail)	Prevalence (%)
I	18	18	-	706	39,22	100
II	16	12	4	283	23,58	75

Test	Sum fish	Seed Infected	Seed no infected	*Trichodina* sp. found	Intensity (individu /tail)	Prevalence (%)
III	16	10	6	326	32,60	62,5
Sum	50	40	10	1315	95,40	237,5
average					31,80	79,16

Source: Processed Data (2024)

Based on Table 1, it can be seen that parasites *Trichodina* sp. From 3 (three) sampling times, the intensity value was obtained at 31.8 individuals/head, which is classified as a medium attack category. This shows that there are ± 31 individual ectoparasites that attack tilapia fry. Meanwhile, the prevalence value was found to be 79.16%, which is classified as a moderate attack category. This is in accordance with the intensity and prevalence categories according to Batubara *et al.,* (2020). According to Nugrayani *et al.,* (2016) factors that influence the level of intensity and prevalence *Trichodina* sp. namely from the density of bacteria and organic matter in the pool, if the number of bacteria in the pool is high, then the number *Trichodina* sp. also high. Quantity dataTrichodinasp, which infects tilapia fry in each organ can be seen in Table 2.

Table 2. Sum *Trichodina* sp. which Infects the Tilapia Seeds in every Organ

Sampling to	Organs			Sum (Individual)
	Fin (individual)	Skin (Mucus) (individual)	Gill (individual)	
I	383	295	28	706
II	79	182	22	283
III	58	129	139	326
SUM	520	606	189	1315

Source: Processed Data (2024)

Based on Table 2 above, it can be seen that parasites *Trichodina* sp. infects all parts of the body of the tilapia fry that are observed, namely the fins, skin (mucus) and gills. So, this is in accordance with Riko *et al.,* (2016) which states that *Trichodina* sp. can infect more than one part of the fish's body, namely the skin (mucus), fins and gills. *Trichodina* sp. The constant movement of body parts that infect fish has various types which can be identified through their morphological characteristics (Windarto *et al.,* 2016). The data above was obtained from a total of 50 tilapia fish seeds. Infected tilapia fry *Trichodina* sp. as many as 40 tails and 10 normal tails. Spread *Trichodina* sp. per sampling seen in Figure 4.

Based on Figure 4 above regarding the distribution *Trichodina* sp, which attacked tilapia fry by taking samples 3 times, the number of attacks was obtained

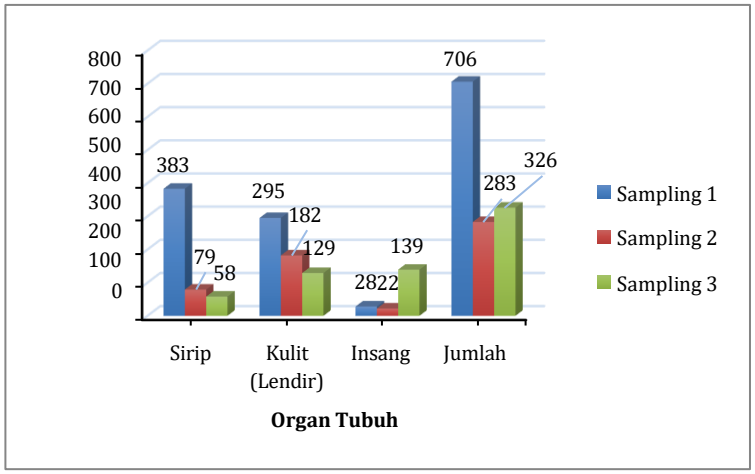

Figure 4. Distribution *Trichodina* sp. per Sampling

Trichodina sp. namely 1315 individuals, the largest number was in the 1st sampling with 706 individuals identified from the fins, body and gills. This is because when taking the first sample, many fish seeds were injured, the bottom of the pond was full of dirt and changes in the weather.

According to Gufranet al., (2018) states that if optimum water quality conditions support the life of fish, the fish will be resistant to parasite attacks so that the parasites will not reproduce to increase their numbers. Cultivator pond water temperature in the 1st repetition (28° C), 2nd repetition (27.7° C, and 3rd repetition (26° C). Based on the three sampling repetitions, the highest temperature was found in the 1st repetition. According to Fisheries and Aquaculture of FAO (2019) states that Trichodínasp, can reproduce by binary fission at an optimum temperature of 20- 29° C. The pH of the 1st replication pool water is (8,5), the pH of the 2nd replication is (8), and the pH of the 3rd replication is (7,5).

Based on the number of 3 samples taken from tilapia fish seeds, parasites *Trichodina* sp. Infecting most parts of the body with a total of 606 individuals. *Trichodina* sp. Many tilapia infect the skin (mucus) because there is mucus where it sticks *Trichodina* sp. and there is lots of food. This is in accordance with Addelin's researchet al (2023) that the level of parasite preference *Trichodina* sp. The mucous part of the body is home to 685 individuals compared to the gills which are only 412 Individuals. High and low values of Intensity and prevalence Trichodinasp. can be influenced by body size and age of the fish. Ectoparasite attacks that attack fish will decrease as the age and size of the fish increases. The larger the size of the fish, the better the fish's immune system will be (Rustikawati *et al.,* 2016). The immune system of fry-sized fish is still weak and very vulnerable to environmental changes, making them more easily attacked by parasites. Total Intensity Trichodínasp. low ones do not really affect the health of the fish.

Species of *Trichodina* sp. Found

Based on the research conducted, 5 species of *Trichodina* sp. were found to

infect tilapia *(Oreochromis niloticus)* fry in the ponds of Jatiwangi farmers, Majalengka Regency, West Java. The various species of *Trichodina* sp. found are *Trichodina acuta*, *Trichodina heterodentata, Trichodina nobilis*, *Trichodina reticulata,* and *Trichodina nigra* can be seen in Figure 5.

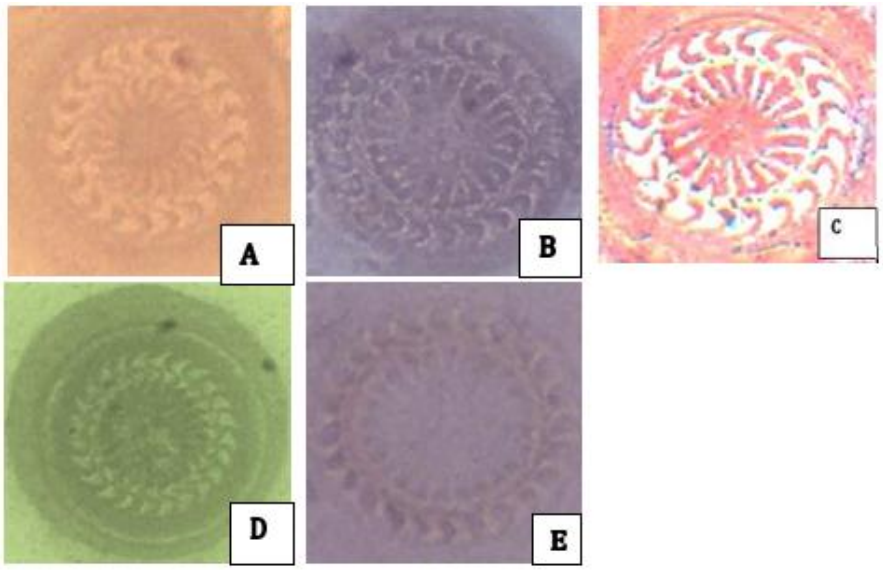

Figure 5. *Trichodina* sp. species found in tilapia fry
A. *Trichodina acuta*, B. *Trichodina heterodentata,* C. *Trichodina nobilis* ,
D. *Trichodina reticulata,* E. *Trichodina nigra*
Source: Personal Documentation (2024)

Variations in morphology and structure of the denticle ring on *Trichodina* sp. are morphometric characters that can be used to determine the species of *Trichodina* sp. The body morphology of *Trichodina* sp. are body diameter (um), denticle ring diameter (µm), denticle diameter (um), thorn length (um), blade length (µm) and number of denticles (fruit). The following is the morphology of *Trichodina* sp. can be seen in Figure 6.

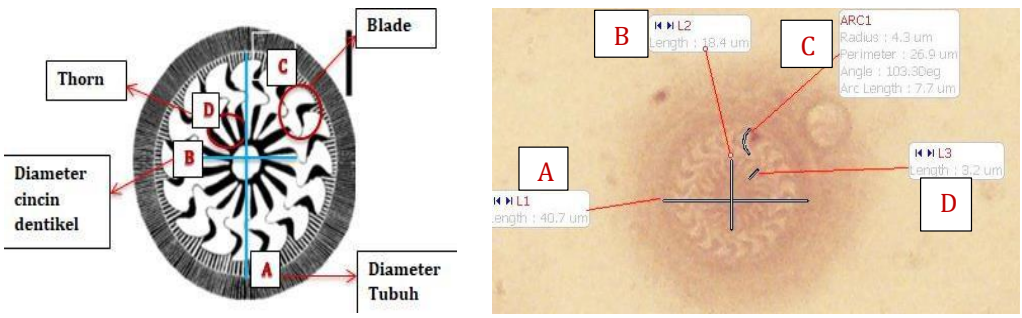

Figure 6. Measurement scheme *Trichodina* sp.
Source: Personal Documentation (2024)

According to Windarto *et al.,* (2016) the differences in *Trichodina* sp. species found in this study can seen from the *blade* and *thorn*, namely the following:

a. *Trichodina acuta*: *Blade* curved like a crescent moon and *thorn* straight but slightly blunted.
b. *Trichodina heterodentata*: *Blade* curved like a sickle but narrower in the center and straight tapered *thorns*.
c. *Trichodina nobilis:* narrower *Blade connection* and *blade aphophysis* tapered and straight tapered *thorns.*
d. *Trichodina reticulata: Blade* slightly blunt and *thorn* is straight, blunt
e. *Trichodina nigra: Blade* is blunter and *thorn* is straighter tapered

The following is the number of species distribution of *Trichodina* sp. found in this study can be seen in Table 3.

Table 3. Sum Species *Trichodina* sp. Research Result

No	Species	Organs			Sum
		Fins	Skin (mucus)	Gills	
1	*Trichodina acuta*	17	26	-	43
2	*Trichodina heterodentata*	37	40	20	97
3	*Trichodina nobilis*	31	45	-	76
4	*Trichodina reticulata*	47	59	24	130
5	*Trichodina nigra*	6	-	18	24
	SUM	138	170	62	370

Source: Processed Data (2024)

Based on Table 4 above, It can be seen that there are 5 species of Trichodina sp. that attack tilapla fish fry. The total number of Trichodina sp. Individuals observed was 370 individuals. *Trichodina reticulata* as many as 130 Individuals which is the highest species and *Trichodina nigra* as many as 24 individuals which is the lowest species.

CONCLUSSION

The study resulted in the identification of parasites infecting tilapia fry in the cultivation ponds of Majalengka Regency, West Java, with an intensity value of 31.8 Individuals/head classified as a moderate infection rate category. While the prevalence value of 76.16% is classified as a moderate infection category. The species of *Trichodina* sp. found consisted of 5 species, namely *Trichodina acuta* as many, as 43 individuals, *Trichodina heterodentata* as many as 97 individuals, *Trichodina nobilis* as many as 76 individuals, *Trichodina reticulata* as many as 130 individuals which is the highest species, and *Trichodina nigra* as many as 24 individuals which is the lowest species.

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