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IDENTIFICATION OF PARASITES INFECTING TILAPIA (Oreochromis niloticus) IN CULTURE PONDS IN KUANHEUM VILLAGE

Identifikasi Parasit yang Menginfeksi Ikan Nila (Oreochromis niloticus) Pada Kolam Budidaya di Desa Kuanheum

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ABSTRACT

Parasites are the main problem faced by fish farmers in Kupang district. The study aimed to identify parasites infecting tilapia (*O. niloticus*) in culture ponds in Kuanheum Village, Kupang Regency, East Nusa Tenggara, so that farmers in the area can handle them properly. Tilapia (*O. niloticus*) were taken randomly and observed for parasite identification at the Kupang Fish Quarantine, Quality Control and Fishery Product Safety Station Laboratory, then analyzed descriptively. Results showed the presence of parasites *Trichodina* sp. and *Cichlidogyrus* sp. in tilapia (*O. niloticus*) in Kuanheum Village.

Key words: *Cichlidogyrus* sp., Identification, *Oreochromis niloticus*, Parasite, *Trichodina* sp.

ABSTRAK

Parasit adalah kendala utama yang dihadapi oleh pembudidaya ikan di kabupaten Kupang. Penelitian bertujuan untuk mengidentifikasi parasit yang menginfeksi ikan nila (*O. niloticus*) pada kolam budidaya di Desa Kuanheum, Kabupaten Kupang, Nusa Tenggara Timur, sehingga pembudidaya di daerah tersebut dapat melakukan penanganan dengan baik dan benar. Ikan nila (*O. niloticus*) diambil secara acak dan dilakukan pengamatan identifikasi parasit di Laboratorium Stasiun Karantina Ikan, Pengendalian Mutu dan Keamanan Hasil Perikanan Kupang, lalu dilakukan analisis secara deskriptif. Hasil menunjukkan kehadiran parasit *Trichodina* sp. dan *Cichlidogyrus* sp. di ikan nila (*O. niloticus*) pada Desa Kuanheum.

Kata Kunci: *Cichlidogyrus* sp., Identifikasi, *Oreochromis niloticus*, Parasit, *Trichodina* sp.

INTRODUCTION

Freshwater fish cultivation in East Nusa Tenggara has increased in recent years. Public interest in cultivating fish, especially in several areas in Kupang district, is increasing (Juanda & Edo 2021; Nalle *et al.,* 2021) . Kuanheum village is in Kupang district which is close to Noekele village, where many people are developing freshwater fish cultivation. In this area,

people like tilapia (*Oreochromis niloticus*) and cultivate them. However, there is a problem that cannot be ignored by farmers, namely parasite attacks on fish (Dawo *et al.,* 2023; Sianturi *et al.,* 2022) .

Parasites that usually attack tilapia (*O. niloticus*) include *Argulus* sp., *Epistylis* sp., *Oodinium* sp., *Trichodina* sp., and *Dactylogyrus* sp. (Amriana *et al.,* 2021; Ihsan & Sitinjak, 2023; Melanie *et al.,* 2022) . Fish that are attacked by parasites will show excessive mucus on the body parts, passive movement, wounds on the body and if the internal organs such as gills and intestines are examined, they will show damage (Dominguez *et al.,* 2023; Rozik *et al.,* 2022; Sutarni *et al.,* 2021) . Parasitic infections in fish will also cause bacterial attacks to appear which further weaken the fish's immune system (Buchmann, 2022; Yulianti *et al.,* 2019) .

Research related to the identification of parasites in tilapia fish (*O. niloticus*) has been widely carried out with the aim of finding out which parasites attack so that treatment can be carried out, both for prevention and treatment (Abiyu *et al.,* 2020; Azizah *et al.,* 2022; Wirawan *et al.,* 2018; Yuliani *et al.,* 2023) . However, the identification of parasites in tilapia (*O. niloticus*) in Kuanheum Village has never been studied, so it is not known what parasites often attack fish there. Therefore, this research was carried out to identify parasites that infect tilapia (*O. niloticus*) in cultivation ponds in Kuanheum Village, so that farmers in the area can handle them properly and correctly so that the productivity of fish farming can be maintained and increased.

METHODS

Place and time of research

The research started in March 2024 and ended in April 2024. This research was located in Kuanheum Village, Amabi Oefoto District, Kupang Regency, East Nusa Tenggara, as the sampling site. The location of the cultivation ponds in the village can be seen in Figure 1. After that, parasite identification checks were carried out at the Kupang KIPM (Fish Quarantine, Quality Control and Safety of Fishery Products) Station Laboratory.

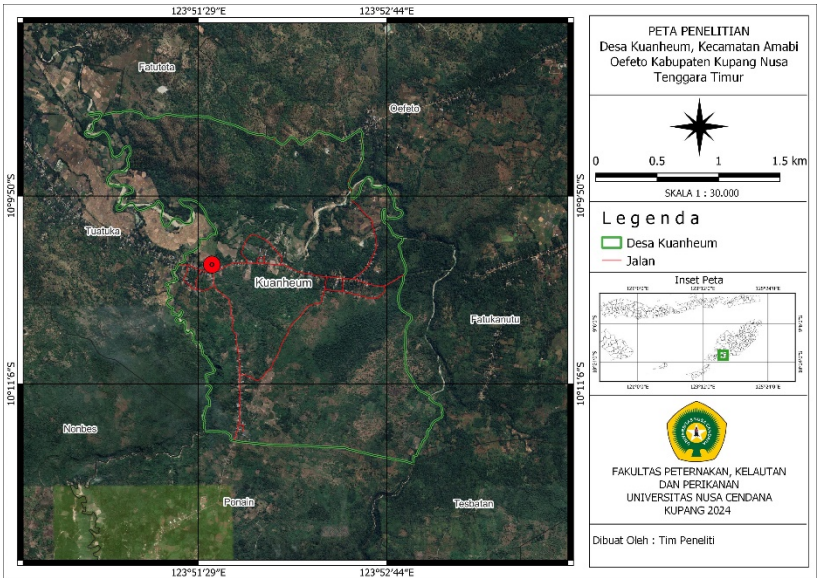

Figure 1. Location of Research (Kuanheum Village)

Tools and materials

In this research, tools such as a net, plastic packing, dissecting set, microscope, object glass, cover glass, DO meter, pH meter and thermometer were used. The use of materials such as cultivation pond water, distilled water and tilapia (*O. niloticus*) measuring 10-15 cm. Additional oxygen is also used in the process of delivering live fish samples to the laboratory for identification (Saleh *et al.,* 2021) .

Research procedure

Tilapia fish (*O. niloticus*) were taken randomly from the cultivation pond, based on the number of fish populations being kept. The live fish are then taken to the laboratory for parasite identification. The parasite identification process is carried out by taking samples from the fish's body, then observing them under a microscope. The results obtained were then compared with Kabata's (1985) parasite identification book and other literature to determine the type (Koniyo *et al.,* 2020) . The additional supporting data is water quality measurements during the research. The sample tested for this measurement was cultivation pond water, where the parameters measured included DO, pH and temperature (Fransira, 2023) .

Data analysis

The data obtained from the results of this research were analyzed descriptively, namely explaining in detail the description of the parasites found. Where the identification results are matched with the results in the data and images contained in other references (Wahyuni *et al.,* 2017) .

RESULTS

The results of parasite identification in tilapia (*O. niloticus*) in the Kuanheum Village cultivation pond showed the presence of the parasite *Trichodina* sp. and *Cichlidogyrus* sp. This infection is not evenly distributed, where you can see the total number of fish infected with the parasite *Trichodina* sp. and *Cichlidogyrus* sp. in Table 1.

Table 1. Total Tilapia Fish (*O. niloticus*) Infected with Parasites

Identified parasites	Total fish whole	Total fish infected with parasites
Trichodina sp.	25	25
Cichlidogyrus sp.	25	3

Results of observations of the parasite *Trichodina* sp. under a microscope on tilapia (*O. niloticus*) in cultivation ponds in Kuanheum Village can be seen in Figure 2.

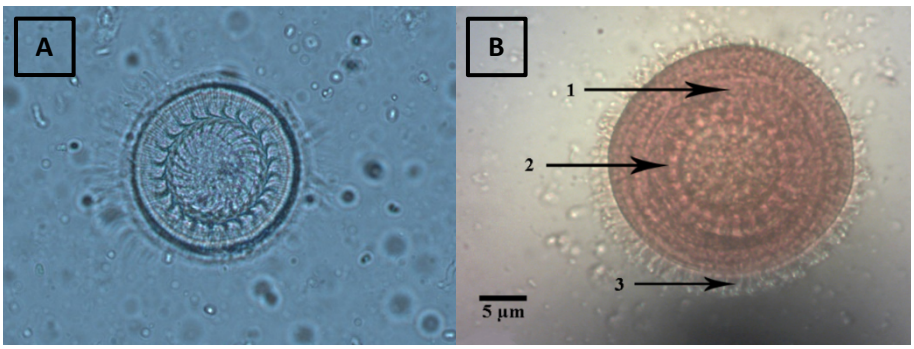

Figure 2. (A) *Trichodina* sp. which was found in Kuanheum Village; (B) *Trichodina* sp. in other research (Kumar *et al.,* 2021)

Results of observations of the parasite *Cichlidogyrus* sp. under a microscope on tilapia (*O. niloticus*) in cultivation ponds in Kuanheum Village can be seen in Figure 3.

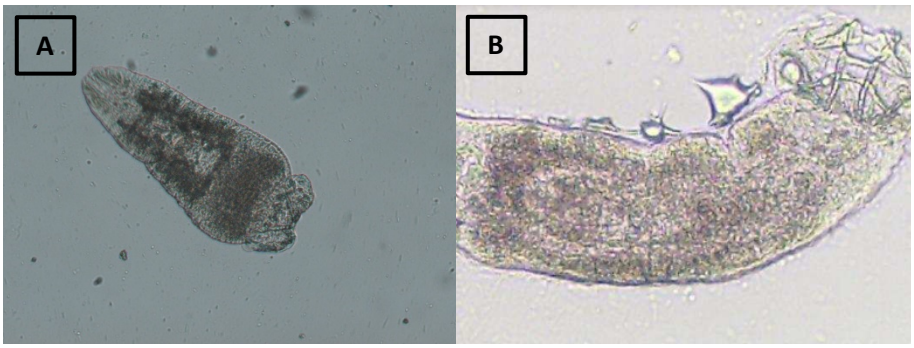

Figure 3. (A) *Cichlidogyrus* sp. which was found in Kuanheum Village; (B) *Cichlidogyrus* sp. in other research (Eliyani, 2017)

The results of water quality measurements in tilapia (*O. niloticus*) cultivation ponds in Kuanheum Village show a normal range. The range of parameters such as DO, pH and temperature can be seen in Table 2.

Table 2. Water Quality Measurement Results

Parameter	Unit	Range on research	Standard range
DO	mg/l	5.18	≥3
pH	-	7.5	6.5 – 8.5
Temperature	ºC	29.3	25 - 32

DISCUSSION

Parasite *Trichodina* sp. and *Cichlidogyrus* sp. including parasites that often disrupt the cultivation of freshwater fish, especially tilapia (*O. niloticus*) (Conchita *et al.,* 2023; Koniyo *et al.,* 2020) . Parasites will infect, causing serious problems and even death in fish farming. This is usually caused by an unsuitable environment or stressed fish conditions, which will result in parasites attacking farmed fish (Melanie *et al.,* 2022) . Parasites generally infect fish by attaching to parts of the fish's body, then sticking their anchors to take nutrients from the host's body (Maryani *et al.,* 2023) . Parasites will also damage fish organs so that metabolism will be disrupted. This can cause fish to die (Tuwitri *et al.,* 2020) .

Trichodina sp. is well-known for infecting the gills of freshwater fish and is often also found in fish mucus (Sumahiradewi *et al.,* 2023) . This parasite has denticles and a round body shape with vibrating hairs that surround the cells (Yuliani *et al.,* 2023) . Denticles function as attachments and also as suckers. The hard structure of the denticles will cause wounds which can be a source of other diseases (Haryono *et al.,* 2016) . Based on the results obtained, samples of tilapia (*O. niloticus*) tested showed quite high levels of parasite infection, where all were positively infected with the parasite *Trichodina* sp. This can be caused by the use of dam water as a water source. The use of water that comes directly from springs with an open and close pool system is one of the factors in the high number of *Trichodina* sp. parasite infections. (Wardani *et al.,* 2021) . Several previous studies also showed high levels of this parasite infection in tilapia (*O. niloticus*). Where the average attack rate is more than 50%, it can even reach 100% (García *et al.,* 2020; Kolia *et al.,* 2021). Attacks by the parasite *Trichodina* sp. in tilapia (*O. niloticus*) resulting in high mucus production, changes in body color and low appetite of the fish (Sanggita *et al.,* 2023) .

Cichlidogyrus sp. included in the monogean class of parasites that infect freshwater fish, especially tilapia (*O. niloticus*) (Alfiyani *et al.,* 2023) . The body shape of the parasite *Cichlidogyrus* sp. are flat or elongated oval, have eye spots, and have edge hooks (Laia *et al.,* 2018) . This parasite will attach to certain organs, then release its eggs several hours after infection (Eliyani, 2017) . In addition, when attached, *Cichlidogyrus* sp. will give oxygen from

the blood along with food essences to the host for nutrition for its reproduction (Kamil *et al.,* 2017) . Based on the results obtained, only 3 samples of tilapia tilapia (*O. niloticus*) showed positive for the parasite *Cichlidogyrus* sp. This shows the low level of infection from this parasite. Several previous studies also showed the low intensity of attacks by the parasite *Cichlidogyrus* sp. Where the level of attack depends on the proliferation of a parasite (Aji *et al.,* 2022; Dawo *et al.,* 2023) . Parasitic infection *Cichlidogyrus* sp. at high intensity causes fish stress. On the fish's body, mucus can also be seen on the scales and there are wounds. Apart from that, fish movement is also reduced (Sutarni *et al.,* 2021) .

Water quality parameters such as DO, pH and temperature are one of the parameters that must be known when cultivating fish, especially in relation to parasite attacks. If water quality is in poor condition, parasite attacks will increase (Ihsan & Sitinjak, 2023; Sianturi *et al.,* 2022). Accumulation of leftover food or organic material can affect water quality and increase the number of parasites in the water (Larasati *et al.,* 2020) . Apart from that, density factors and also the length of contact between parasites and the host will influence parasite attacks. Especially in ponds with high densities, if fish infected with parasites are not separated, the spread of parasites to other fish will be faster (Handayani & Siswanto, 2022). Based on the results obtained, the range of DO, pH and temperature parameters is in the normal range. Normally the range of water quality parameters will support the life of farmed fish so that fish growth and fish body resistance to parasites increase. Apart from that, the development of parasites will also be hampered (Kurnia *et al.,* 2019) .

CONCLUSION

Based on the results of research on tilapia fish (*O. niloticus*) in Kuanheum Village, parasites were found including *Trichodina* sp. and *Cichlidogyrus* sp. The most frequently identified parasite is *Trichodina* sp. in this research.

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