The occurrence of endoparasite helminth on Threadfin Bream (Nemipterus japonicus) from the fish auction place Mayangan, Probolinggo, East Java

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Abstract. This study aims to determine the occurrence of helminth endoparasites that infect threadfin bream from Fish Auction Place of Mayangan, Probolinggo, East Java, Indonesia. Helminth endoparasite found in the stomach, intestine (mucosa), and threadfin bream’s liver were third-stage larvae of Anisakis simplex type I. The prevalence of Anisakis simplex infected threadfin bream in sizes 10-16 cm was 5.71% and in sizes 17-25 cm was 17.1%. The differences in the prevalence of threadfin bream endoparasites in different sizes did not show a significant difference.

1. Introduction
Threadfin bream (Nemipterus japonicus) includes demersal fish, which is widely used by consumers in the form of fresh fish, fermentation, basic surimi products, fish flour, fish meatballs and dried salted [1]. The fish has high value in protein and such a low-fat fish. The threadfin bream protein and fat reaches 16.85% and 2.2% [2].

The disease can arise due to the imbalance of interactions between host, pathogen, and environment. One of the causes of disease in fish is caused by parasites. Parasites are organisms that live on or inside other organisms to obtain food [3]. Infection agents that are often found in marine fish and cause illness, including endoparasite helminth. Endoparasites are parasites that live in internal organs, such as in the muscles, organs, and membrane layers of the cavity of the host [4]. The presence of endoparasite in the fish body can reduce the level of fish consumption due to several species of endoparasite that are zoonotic [5].

According to [6] endoparasite from the family Anisakidae can cause Anisakiasis in humans. Anisakiasis can cause several symptoms, including pain in the lower abdomen, nausea, vomiting, fever, diarrhea, and the presence of blood in the stool. Family Anisakidae can infect humans by consuming raw fish, and undercooked cooking containing parasite larvae in fish meat. The purpose of this study was to determine the occurrence of endoparasite...
helminth that infects threadfin bream, estimate, and analyzes the prevalence of helminth infect
Threadfin Bream.

2. Materials and methods
2.1. Sample collection
A total number of 70 Threadfin bream (Nemipterus japonicus) were carried out from Mayangan Fish
Auction Place, Probolinggo. All samples collected were transported to the Laboratory of Fish
Anatomy, Fisheries and Marine Faculty, Universitas Airlangga, Surabaya.

2.2 Helminth endoparasites examination
We classify the samples into two classes, which are 10-16 cm in size and 17-25 cm in size. Fish
specimens were observed for the helminth endoparasites. Length and weight were recorded, and the
gastrointestinal tract was dissected for examination, then placed in a petri dish, cut open longitudinally
and examined for helminth using an Olympus stereoscopic microscope and Lucida camera.

All nematodes were identified and calculated for the prevalence. The identification of helminth
endoparasite was done based on [7] [8] [9] [10]. The prevalence was calculated based on [11] as
follow:

\[
\text{Prevalence} = \frac{\text{Number of fish infected}}{\text{Number of sample}} \times 100\%
\]

3. Result and discussion
3.1 Anisakis observation
From the 70 samples of threadfin bream (Nemipterus japonicus) we found third-stage larvae of
Anisakis simplex (Anisakis type I). The helminth from family Anisakidae was found attached to the
mesenterium of the abdomen, stomach, intestine (mucosa), and liver (Fig. 1).

Figure 1. Third-stage larvae Anisakis simplex in threadfin bream (Nemipterus japonicus). A.Anterior
part of Anisakis simplex (400x magnification); B. the ventriculus (100x); C. posterior part of Anisakis
simplex (400x ); (larva tooth (lt); excretory pore (ep); excretory duct (ed); oesophagus (oe); mucron
(m); anal (a); rectum (r); rectal gland (rg); intestine (i); ventriculus (v)).
The third-stage larvae Anisakis simplex are included in the phylum Nemathelminthes, class Nematode, order Ascaridida, family Anisakidae, genus Anisakis and species Anisakis simplex [12]. Third-stage larvae Anisakis simplex has a transparent lip that serves to absorb organic matter from the intestinal wall. In the anterior part, there were tooth larvae that function to puncture the walls of the small intestine and at the same time hold on to the mucosa of the small intestine so that it does not escape during intestinal contractions in digesting food. Third-stage larvae Anisakis simplex were found to have 0.47-0.73 mm ventriculus in size. This is the following [9] which found Anisakis type I with ventriculus measures 0.65-0.79 mm and mucron in the posterior part.

The third-stage larvae Anisakis simplex found in this study has a mucron in the posterior end of the body, which by [9] stated that Anisakis larvae are divided into two types, Anisakis larvae type I and type II. The difference between the two types is the presence of the mucron. There are mucron, boring tooth and ventriculus in Anisakis larvae type I, while Anisakis larvae type II only has boring tooth and ventriculus, without mucron at the posterior end.

Third-stage larvae Anisakis simplex found in this study had 0.47-0.73 mm in ventriculus size. This is the following [9] which found Anisakis type I with ventriculus measures 0.65-0.79 mm and mucron in the posterior part.

3.2 The prevalence of Anisakis
The prevalence of Anisakis was 5.7% for the fish with 10-16 cm in size and 17.11% for the 17-25 cm in size (Table 1).

Table 1. Prevalence of Threadfin Bream (Nemipterus japonicus) containing third-stage larvae *Anisakis simplex*

| Fish size (cm) | Number of samples | Number of fish infected | Prevalence (%) |
|---------------|-------------------|------------------------|----------------|
| 10 - 16       | 35                | 2                      | 5.7            |
| 17 - 25       | 35                | 6                      | 17.1           |
| Total         | 70                | 8                      | 11.4           |

The prevalence of Threadfin bream (Nemipterus japonicus) with 10-16 cm in size was 5.7%, while the prevalence of threadfin bream (Nemipterus japonicus) with 17-25 cm in size was 17.1%. Threadfin bream (Nemipterus japonicus) with a length of 17-25 cm has a greater prevalence value than threadfin bream (Nemipterus japonicus) with a length of 10-16 cm. According to [14] that several factors influence the number, size, behavior of each parasite against the host, including age, host size, climate, season, and geographical location. Larger fish have more food availability than smaller fish so the possibility of parasites to move to another host is small or even non-existent. Larger fish have a longer life span, meaning that the age of fish is getting older so the chance of being exposed by Anisakis simplex third-stage larvae is also higher during their lifetime [15]. The number of third-stage larvae Anisakis simplex in fish is also influenced by eating habits, fish micohabitat, and fish species and the condition of the water of an area [16].

The prevalence of endoparasite helminth from each size was then analyzed by the Chi-Square test to determine the difference in the value of the prevalence of endoparasite helminth between two different sizes. The results of these calculations using the Chi-Square test did not show a significant difference (p > 0.05) between the prevalence of each size.

There was no significant difference between the different fish sizes for the prevalence of endoparasitic helminths that infect threadfin bream (Nemipterus japonicus). We analyze because of several factors, including the condition of the waters where the fish were captured. By the statement of
that the presence of host infecting endoparasite helminth is influenced by the size, age, host resistance and the condition of the waters where the fish are located.

4. Conclusion
*Anisakis simplex* type I was found infect Threadfin Bream (*Nemipterus japonicus*) with a total prevalence of 11.4%.

5. Reference

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