Infection analysis of *Rhadinorhynchus bicircumspinis* in barramundi (*Lates calcarifer*) from pond and floating net cage in Situbondo waters.

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Abstract. Barramundi (*Lates calcarifer*) was known as highly demand of fisheries commodity and exported in many countries. Pond and floating net cage culture of barramundi have several problems that cause many mortality in fish, such as endoparasite infection. This study aims to determine and to count the prevalence and intensity of endoparasite *Rhadinorhynchus bicircumspinis* in barramundi (*L. calcarifer*) from pond and floating net cage in Situbondo waters. Sixty samples of barramundi with length 18.18 ± 1.41 cm were taken from ponds and floating net cages and examined for endoparasite from digestive track, liver, gonad and kidney. The result showed endoparasite *R. bicircumspinis* was found from digestive track with prevalence was 10% and 40% in pond and floating net cage, respectively. The intensity of endoparasite *R. bicircumspinis* was 1 and 2.5 in pond and net cage, respectively. Further studies were needed to examined the histopathological damage caused by *R. bicircumspinis* infection.

1. Introduction

Demanding of barramundi (*Lates calcarifer*) was continuously increased every year. Based from Food and Agriculture Organization (FAO) reports, Indonesian has occupied on fourth as biggest barramundi producers in the world that can supply 8.2% from all barramundi needs in the world. Demanding of barramundi can fulfilled from cultivation and natural caught. Barramundi cultivation that held in ponds and net cages cannot detached from infectious disease, such as caused by parasites [1]. Parasites in fish can cause stress that affected to decreation on growth and reproduction until mortality [2]. Furthermore [3] stated that parasitic infection can killed the host and caused highly loss for fisheries industries. Especially for endoparasites infection can infect the human that consume raw or half-cooked fish that contamined by parasite larvae [4]. Parasite accumulation in human can caused inflammation, lesion and necrosis in intestinal organ. Moreover, at the cronic condition, parasites can caused gastrointestinal cancer [5]. One of the endoparasites that potentially infect the human was *Rhadinorhynchus bicircumspinis* from Acanthocephalans [6].

Previous study was reported the infection of *Rhadinorhynchus* in fish has been reported from mackarel (*Scomber australasicus*) in Taiwan [7]; yellowtail (*Decapterus kurroides*) from Vietnam [8] and chub mackerel (*Scomber japonicus*) in Peru [9]. Whereas, the report about *R. bicircumspinis* infection has been infected in *Platycephalus bassensis* from Australia [10] and *Bagrusbajad* from Nile river [11]. Information about *R. bicircumspinis* infection from cultivation of barramundi was limited, therefore the aims of this study was to analyze the infection degree of *R. bicircumspinis* in barramundi.
that cultivated in ponds and net cages. Result of this study can be basic data for mapping the
distribution of endoparasites infection in barramundi.

2. Material and method

2.1. Material
Material that used in this research i.e barramundi (18.33 ± 1.43 cm length and 71.65 ± 23.63 gram
weight), alcohol glycerin 5% (solution alcohol 70% and glycerin), physiological saline 0.9% (Otsuka),
alcohol 70% (Onemed), HCl, NaHCO3 (Merck, Germany), alcohol 85%, alcohol 96% (Onemed),
Entellan (Merck) and Acetocarmine (Merck). Instrument that used in this research were coolbox 16 L
(Lion Star, Indonesia), section set, object and cover glass, digital scale (OHAUSS, USA), ruler,
trinocular microscope with drawing tube (Nikon Eclipse E-200, Japan), sample bottle, microtube 1.5
mL, beaker glass.

2.2. Research Procedures
Sixty barramundi samples (L. calcarifer) (length 18.18 ± 1.41 cm) that collected from pond and
floating net cage in Center of Brackishwater Aquaculture, Situbondo. The total number of sample that
taken from each location were 30 tail [12]. Samples were packing in the coolbox and carried to Fish
Health Laboratory Center of Brackishwater Aquaculture, Situbondo to examined.

2.3. Sample Examination
Samples of barramundi was measures the length, sectioned to examined the endoparasite from
digestive track, liver, gonad and kidney. Endoparasite that found was entered to the microtube that
contains alcohol glycerin 5% solution and staining with Aceto-Carmine method [13]. Identification of
R. bicircumspinis based from [14]; [10]; and [11]. Prevalence and intensity was counted based from
description of [15] and categorized by [16].

2.4. Data Analysis
Prevalence and Intensity that have categorized will be analized by descriptive method with table and
figure

3. Result and discussion
Based to analysis infection of R. bicircumspinis in barramundi (L. calcarifer) (Table 1), we found that
the prevalence and intensity of R. bicircumspinis from net cage was higher than pond. Its can
happened because the condition of net cage and natural feed that consumed by fish in different
location. Net hygiene that used was an important role for fish healthy status that cultivated. Net that
was attached by many invertebrates, moss and macro algae will be used as substrate to attachment for
parasites. Moreover, sea pollution also decline the fish immune system that affected to the
susceptibility to infectious disease [17]. Previously study also found acanthocephalans, Serrasentris
sagittifer infected in L. calcarifer from mariculture in Lampung Bay, Indonesia [18].

The presence of competitor such as molluscs, crustacean and arthropods can become an intermediet
host of R. bicircumspinis. Its suspected that R. bicircumspinis that infect the barramundi because the
trash fish that used as feed was contaminated by parasite larvae. Furthermore, parasite larvae will
penetrate the intestinal mucosa and develop into adult and attach to the digestive wall of barramundi
with the help of proboscis and producing the eggs. [19]. Most of acanthocephalans use amphipod or
ostracods as intermediet host [20]. Furthermore, [21] stated that Nyctiphanes couchii as intermediet
host in life cycle of Rhadinohynchus.

Table 1. Analysis Infection of R. bicircumspinis in barramundi (L. calcarifer) from pond and net cage

| No. | Sampling location | Number of Fish Sample | Number of Infected Fish | Number of Parasite | Prevalence (%) | Intensity |
|-----|------------------|-----------------------|-------------------------|-------------------|----------------|----------|
| 1.  | Pond             | 30                    | 3                       | 3                 | 10 (often)     | 1 (light)|
| 2.  | Net Cage         | 30                    | 12                      | 12                | 40 (commonly) | 2.5 (light)|


Effect of endoparasite infection on barramundi was reducing the fish weight and size. Moreover, at the severe infection can effect to lesion in gastrointestinal tract that can affect to the secondary infection and caused the mortality [17]. Especially for acanthocephalans that can affect to chronic fibrosis, destruction of intestinal villi and necrotic and degenerative changes in mucosal epithelium adversely affect motility and the absorptive efficiency of the fish intestine. This might affect the general health and growth of the fish [22].

4. Conclusion
The prevalence and intensity of *R. bicircumspinis* from net cage was higher than pond. Further studies. Further studies were needed to examined the histopathological damage caused by *R. bicircumspinis* infection.

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