Preface

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The 3rd International Conference on Fisheries and Marine Sciences (INCOFIMS) Surabaya Indonesia, 10 September 2020

International conference on fisheries and marine sciences (INCOFIMS) is an annual conference organized by Faculty of Fisheries and Marine Universitas Airlangga, Surabaya, Indonesia. The main aim is to provide a sharing platform that enables researchers, academics and practitioners from all over the world to share their most recent findings as well as to propose the best strategies to address issues and challenges which we have been currently facing in aquaculture and fisheries practices worldwide. The 1st INCOFIMS was held successfully offline in Surabaya in 2018, followed by the second in 2019.

The 3rd INCOFIMS was previously scheduled offline in Surabaya on 10th September 2020. However, due to the Covid-19 pandemic and travel restriction for foreigners come into Indonesia as well as traveling within the Indonesian islands, we had the 3rd INCOFIMS in a virtual format with ZOOM on 10 September 2020, and hosted from Faculty of Fisheries and marine, Univestias Airlangga, Surabaya Indonesia. We were unable to postpone the event because INCOFIMS is our annual event and also most of the participants requested to have the conference in the virtual format (online)

The theme in the 3rd INCOFIMS was "challenges and strategies for the development of sustainable aquaculture and fisheries". Technically, we had the conference divided into 2 (two) sessions in general: (1) keynote speaker session and (2) guest speaker session. In the keynote session, we had 3 (three) keynote speakers delivering a speech which were Prof. Andrew Greig Jeffs from Newzealand, Prof. Mustafa Kamal from Malaysia, and Dr Gunanti Mahasri from Universitas Airlangga. Each keynote speaker had 1.5 hours for giving a presentation using **ZOOM** and 30 minutes for discussion in one virtual room. After the keynote speaker session, we proceeded to the guest speaker session in which all participants were divided into 7 (seven) rooms according to our subtopics for oral and poster presentations:

Room 1: Aquaculture technology
Room 2: Fish Nutrition
Room 3: Fish Diseases
Room 4: Fisheries Management
Room 5: Marine sciences,
Room 6: Aquatic Resource management, and
Room 7: Fisheries socioeconomics

In this session, every speaker had 15 minutes for presentation and 5 minutes for discussion. Total participants joined in this conference was 225 participants from at least 6 different countries (Australia, New Zealand, Switzerland, Malaysia, Taiwan and Indonesia).

The conference was in general quite successful, acknowledging the number and enthusiasms of participants during the discussion sessions in both the keynote speaker session and guest speaker's session. We thank all participants and organizing committee for their support to this conference and see you in the 4th INCOFIMS 2021.

Chairman
Muhamad Amin, Ph.D

ORGANIZING COMMITTEE

Peer review declaration

Peer review declaration

All papers published in this volume of IOP Conference Series: Earth and Environmental Science have been peer reviewed through processes administered by the Editors. Reviews were conducted by expert referees to the professional and scientific standards expected of a proceedings journal published by IOP Publishing.

- **Type of peer review:** Double-blind

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  2

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Prevalence and intensity of endoparasitic helminth on swamp eel (*Monopterus albus*) from natural caught and cultivation

Prevalence and intensity of endoparasitic helminth on swamp eel (*Monopterus albus*) from natural caught and cultivation

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Abstract. Swamp eel (*Monopterus albus*) is one of the highly prospect freshwater fisheries commodities that are consumed by broad community. Marketed swamp eels are generally derived from natural caught and cultivated eels. Natural caught swamp eel has high risk of infected parasites from a natural feed that contaminates with larvae of the parasite of cultured swamp eel could be infected with a parasite from poor pond biosecurity. Information about the types of parasites that infect swamp eels from natural caught and culture has never been reported before. The aims of these studies were to identify the endoparasite and calculate the prevalence and intensity of endoparasite in swamp eel from natural caught and cultivation. A total of one hundred and twenty swamp eel (37.7±2.5 cm height) collected from natural caught and pond culture in Banyuwangi. Two endoparasites helminth were infected to eels from natural caught and cultivation i.e *Eustrongylides ignotus* and *Pingus sinensis*. The higher prevalence and intensity of endoparasites helminth were found in swamp eel from natural caught than cultivation. Further studies were needed to molecular identified of endoparasite in swamp eel with a scanning electron microscope or 16rDNA.

1. Introduction

Swamp eel is one of the freshwater fisheries commodities that are consumed by people, it brings swamp eel has a high market prospect, even as export commodity. Swamp eels in the market came from caught and cultivated eels. Caught swamp eels have a higher risk of parasites than a cultivated eel in controlled environments [1]. Parasites can infecting eels through the natural food their consume because natural food is a carrier agent (intermediate host) such as annelids (*Lumbricus variegatus*, *Tubifex tubifex*, and *Limnodrilus* sp.) are natural food for eels which as a intermediate host the endoparasites in the eel's body [2,3].

Bad environment cultivation can cause parasites to attack swamp eels. This causes the eel stress, and can reduce the body's resistance, so it can make it easier for pathogens to infect [4]. Inappropriate environmental conditions can lead to decreased growth of swamp eel (*Monopterus albus*), it causes to be susceptible infected by pathogens.

Some endoparasite worms such as *Gnathostoma spinigerum* [1], *Proleptine* sp, *Clinostomum complanatum* [5], *Procamallanus*, *Pingus sinensis*, and *Eustrongylides ignotus* [6] are found in swamp eels that can make consumers and cultivators loss. A disadvantage is a potential disease in human that consumes it [7] such as Gnathostomiasis [1]. The existence of the parasites that did not know by cultivators can cause many decreases in the quality and quantity of products, therefore that it has an impact on an economic losses in cultivation [8]. Information about the types of parasites that infected

in cultivation eels has never been reported, therefore research on identifying parasites that infect natural catches and cultivation is needed to obtain basic data in the prevention of zoonotic diseases in humans.

2. Material and methods

The research study was implemented in January to March 2020. Swamp eel samples came from cultivator, and catcher of swamp eel (*M. albus*) in Banyuwangi District. Total of samples examined was 120 eels (37.7±2.5 cm height). The organs examination are skin, fins, body cavity, kidneys, gonads, and digestive tract. The staining was performed by using the Semichen Acetic Carmine method [9]. The parasites were observed with a microscope each 100x and 400x, and morphologically identification are based from Xiong *et al.*[10], Moravec *et al.* [11], Moravec *et al.*[12], Aray and Smith [13]. Calculations of prevalence and intensity rates used the formula [14]:

Prevalence = (fish infected by parasite/fish samples examined) × 100%

Intensity = (parasites found/fish samples infected)

3. Result and discussion

3.1. Result

The results showed that from a total of 120 samples, there were 14 eels (23.3%) from caught swamp eels and 3 eels (5%) from cultivated swamp eels that are positively infected by *Eustrongylides ignotus* (Figure 1) and *Pingus sinensis* (Figure 2). They infected the digestive tract of caught swamp eels. Meanwhile, the endoparasite that infected cultivated swamp eels is *P. sinensis* (Figure 2). The prevalence and intensity of swamp eels from natural caught respectively 23.3% and 1.5, was higher than they that were cultivated of swamp eels respectively 5 % and 1 (Table 1).

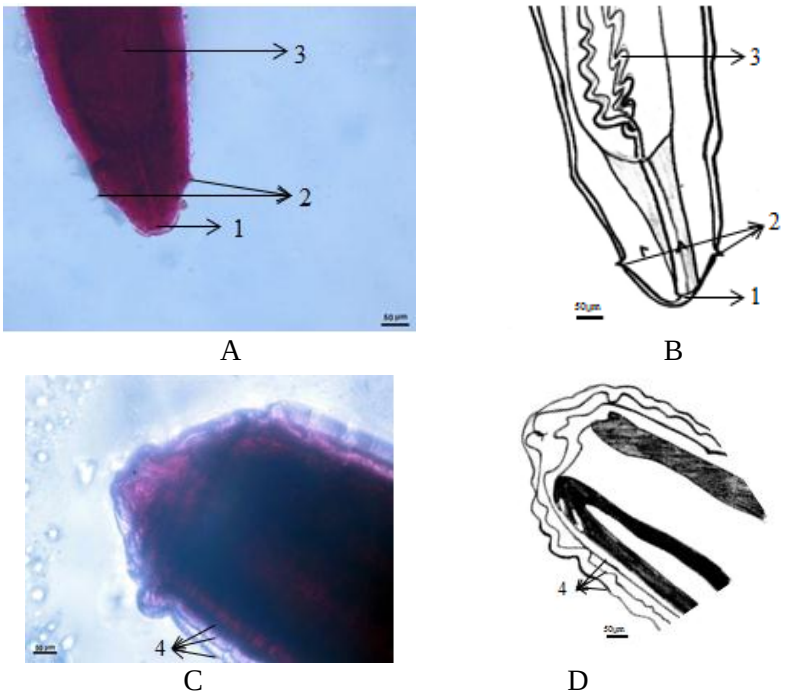

Figure 1. *Eustrongylides ignotus*. Images taken using Semichoen Acetic Carmine staining, and with a binocular microscope equipped with a Lucida camera; bar scale = 50 µm. (A-B) Anterior; (C-D) Posterior; (1) Mouth; (2) Labial papillae; (3) digestive tract; (4) cuticle layer.

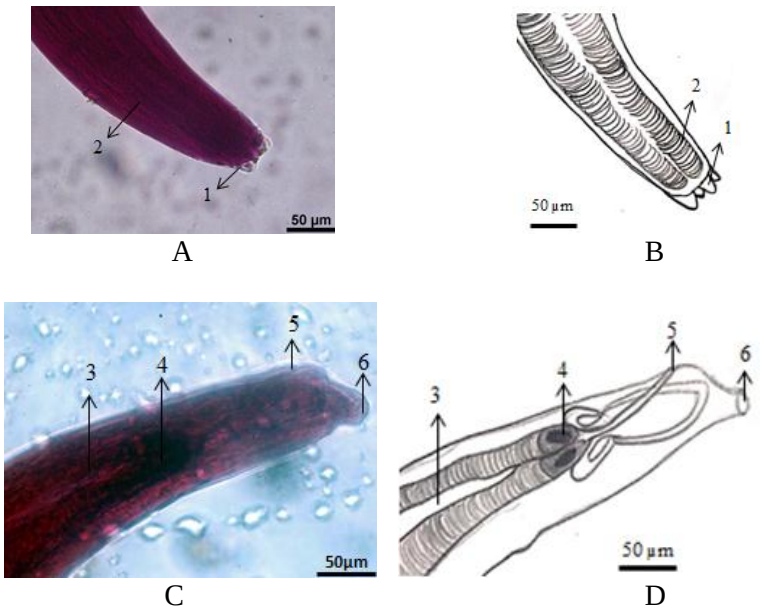

Figure 2. *Pingus sinensis*. Images taken by using Semichoen Acetic Carmine staining and with a binocular microscope equipped with a Lucida camera; bar scale = 50 µm. (A-B) Anterior; (C-D) Posterior; (1) Papillae (2). Esofagus; (3) Ventriculus; (4) Ovary; (5) Anal hole; (6) Caudal.

Table 1. Prevalence and intensity of caught and cultivated eels infected with the endoparasitic worms

Location	Total of sample	Infectected fish	Amount of Parasite	Prevalence (%)	Intensity
Caugh	60	14	21	23.3	1.5
Cultivation	60	3	3	5	1

3.2. Discussion

The endoparasitic helminth that found infected swamp eels were *E. ignotus* and *P. sinensis*. *E. ignotus* was found infect the digestive tract of catch and cultivated swam eels. The identification of *E. ignotus* was implemented referring identification key of Xiong *et al.* [10], Aray and Smith [13]. Based on observations, *E. ignotus* has an elongated cylindrical shape with body lengths ranging from 40-50 mm. The anterior part of *E. ignotus* is more pointed with papillae, and gastrointestinal tract while the posterior part of *E. ignotus* has three layers of cuticle. The morphology of *E. ignotus* can be seen in Figure 1.

Other endoparasitic helminth that infected in swamp eels was *P. sinensis*. *P. sinensis* has an elongated cylindrical body shape with a body length of 3-8 cm, body width 0.12-0.16 mm, esophageal length 0.56-0.64 mm, the anterior part equipped with four papillae, whereas at the posterior portion of *P. sinensis* is equipped with anal, uterine, ventricular, and caudal. The morphology of *P. sinensis* worms can be seen in Figure 2.

The high score of the calculation prevalence and intensity of natural catches swamp eels can be caused by catches swamp eels consumed uncontrolled feed, that it was as an intermediate host of the endoparasites that was the potential to contain cysts or larvae parasite [15]. Besides that the presence of the endoparasite found in the host also influenced by several factors as follow: size, age, habitat, and the condition of the waters where the eels live [16], high soil nutrients, and high density of annelids (*Lumbricus variegatus*, *Tubifex tubifex*, and *Limnodrilus* sp.) as intermediate hosts endoparasite [2,3]. The prevalence of cultivated swamp eels was 5%, it classified as an Occasionally, and intensity of cultivated swamp eels was 1, therefore classified as low infected by parasites [17]. The low score of the prevalence and intensity of cultivated swamp eels because cultivated swamp eel feed is more controlled , therefore it can suppress infections the parasite. Beside that the endoparasitic

infections in eels is caused by eating habits host [1]. In cultivation swamp eels, it is not found *E. ignotus*, it's caused by geographical location of the cultivation sites located in highland (400-650 MDPL). Life cycle of *E. ignotus* has a definitive host, Ardeidae that is a bird that lives and eating in lowland and coastal areas [18] that was infected by *E. ignotus*, are reported to be in the estuary environment.

Intensity value which is classified low, this is causes the eel doesn't show clinical symptoms. If the scoring intensity is high, it causes eel's stress and it will be showing clinical symptoms [19]. A high value the intensity can threaten cultivation because it can increase the transmission of infection and causing environment to be potential in the spread of infectious diseases [20]. A value of intensity parasitic be affected by several factors such as body size, immune system, influence of movement, food, and environmental cultivation [21].

4. Conclusion

The conclusion of this study were two endoparasites helminth infected the eels from natural caught and cultivation are *E. ignotus* and *P. sinensis*. The prevalence and intensity of the endoparasites helminth were found from natural caught are higher than cultivation. Further studies were needed to identify the endoparasite in swamp eel with a scanning electron microscope or a molecular analysis.

5. References

[1] Sieu T P M, Dung T T K, Nga N T Q, Hien T V, Dalsgaard A, Waikagul J, and Murrell K D 2009 *J. Parasitol.* **95**, 246-249.
[2] Coyner D F, Spalding M G, and Forrester D J 2002 *J. Wildl. Dis.* **38**, 483-499.
[3] Coyner D F, Spalding M G, and Forrester D J 2003 *J. Parasitol.* **89**, 290-298.
[4] Luo Z 2007 *J. Anhui Agric. Sci.* **35**, 112-118.
[5] Handayani S K 2014 *Identifikasi dan prevalensi cacing pada usus, hati, dan ginjal belut sawah (Monopterus albus) yang dipasarkan di Kota Surabaya, Jawa Timur* (Surabaya: Universitas Airlangga) 73 p [in Indonesian].
[6] Bakti DI , Gunanti M, Alamsjah M A, Abdillah A A ,and Ulkhaq M F 2019 *Indian Vet. J.* **96**, 62-64.
[7] Park C W, Kim J S, Joo H S, and Kim J 2009 *Korean J Parasitol.* **47**, 401-404.
[8] Manurung U N, and Gaghenggang F 2016 *e-Journal Budidaya Perairan* **4**, 26-30 [in Indonesian].
[9] Heil N 2009 *National wild fish health survey-laboratory procedures manual* 5.0 edition (U.S. Fish and Wildlife Service: USA).
[10] Xiong F, Wang G T, Wu S G, and Nie P 2009 *J. Parasitol.* **95**, 1035-1039.
[11] Moravec F, Nie P, and Wang G 2003 *Folia Parasitol.* **50**, 220-230.
[12] Moravec F, and Nagasawa K 2018 *Folia Parasitol.* **65**, 1-22.
[13] Aray P H and Smith J W 2016 *Guide to the Parasites of Fishes of Canada* Part V: Nematoda. *Zootaxa* **4185** (Auckland, New Zealand: Magnolia Press) p 274.
[14] Alifuddin M, Hadiroseyani Y, and Ohoiulun I 2003 *JAI* **2**, 93-100.
[15] Chen X, Fang S, Wei L, and Zhong Q.2019 *PeerJ.* **7**, 8176-8182.
[16] Stromnes E, and Andersen K 2003 *J. Parasitol. Res.* **89**, 335-341.
[17] Williams E H, and Williams L B 1996 *Parasites of Offshore Big Game Fishes of Puerto Rico and the Western Atlantic. Puerto Rico* (Rio Piedras: University of Puerto Rico) p 5.
[18] Coyner D F, Spalding M G and Forrester D J 2004 *Comp. Parasitol.* **71**, 262-263.
[19] Maulana D M, Zainal A M, and Sugito S 2017 *JIM FKP Unsyiah* **2**, 1-11 [in Indonesian].
[20] Wahyuni S, Hendri A, and Erlita E 2017 *Jurnal Akuakultura* **1**, 29-36 [in Indonesian].
[21] Mahasri G, Wulansari P D, and Imani I H 2019 *Jurnal Kelautan Tropis* **22**, 135-140 [in Indonesian].

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