

Acanthocephala worm detection in cavity body of frog (*Fejervarya cancrivora*) in Surabaya, Indonesia

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(Received 16 April, 2020; Accepted 14 July, 2020)

ABSTRACT

The purpose of this research is to detect *Acanthocephala* worm in cavity body of frog (*Fejervarya cancrivora*) in Surabaya. Frog is one of food source with high protein and nutrition. Despite being one of the main exporter of frog's leg, there is still a few studies that have been done about possible zoonotic trait from frogs which consume by human in Indonesia. One of the possible disease that could infect frog and transmitted to human is acanthocephaliasis, infection from worm from the phylum *Acanthocephala*. In *Acanthocephala* life cycle, frog could act as definitive, paratenic, or intermediate host, which makes it interesting as frog life involve metamorphosis. Frog that was used as sample were 50 frogs. The research method used was survey cross-sectional study. Based on the result of this research, 28 frogs were infected by *Acanthocephala* in the body cavity of the frog with total prevalence value of 56%.

Key words : *Acanthocephala*, *Fejervarya cancrivora*, Cavity body, Surabaya

Introduction

Indonesia were known as one of the country with a large diversity of amphibian within the country wildlife. One of them that still has little information is frog. Frog is one of food source with high protein and nutrition, it is also popular abroad especially in Europe and America served as a cuisine, cooked or raw. In the Southeast Asia, Indonesia has historically been the largest exporter of frog's legs Warkentin *et al.* (Warkentin *et al.*, 2009) with 5.600 tons exported in 1992 (Kusrini and Alford, 2006). From the data of Indonesian Ministry of Fisheries, there are at least 22 exporter of frog's leg that can be found in Java and Sumatra Island. The frog trade has increase over the course of year but the industry around frog trading in Indonesia has not been properly monitored. There is still no official monitoring standart for this industry, and unlike other consumable meat in the market with operational standart

and regular monitoring, frog meat processing still doesn't have standart guide line that cater to the industry, such as data collecting of possible disease that could be trasmitted from cosumeable frog to human.

Despite being one of the main exporter of frog's leg, there is still a few studies that have been done about possible zoonotic trait from frogs which consume by human in Indonesia.

One of the possible disease that could infect frog and transmitted to human is acanthocephaliasis, infection from worm from the phylum *Acanthocephala*. *Acanthocephala* (derived from greek, acantho = thorn, chepalah= head) also refer to as thorny-headed or spiny-headed (Goater *et al.*, 2014). Acanthocephaliasis in human were caused by ingestion of the host and frog in *Acanthocephala* life cycle can act as intermediate, paratenic, or defintive host depending on which stadium and where it is found.

Clinical manifestation of acanthocephaliasis

range from asymptomatic to severe, including abdominal pain, distention, intestinal perforation, loss of appetite, nausea, vomiting, weight loss, constipation, bloody stools, and eosinophilia (Mathison *et al.*, 2016).

Materials and Methods

This research was conducted at laboratory of Veterinary Parasitology Department Faculty of Veterinary Medicine Universitas Airlangga. This research was categorized as survey cross-sectional study with the purpose to find *Acanthocephala* worm in body cavity of frog (*Fejervarya cancrivora*) in Surabaya. This research used 50 frogs captured from frog's collector. The research was conducted from May – June 2018.

The 50 frogs were put in a sack while still alive. Then the samples were dissected, the parasite found was put into physiological NaCl solution as a sample's preservative and then labeled the date of sampling.

The samples were euthanized by damaging the brain of the frog. Afterward, the frog was placed within a board and fixated by piercing all of its limbs with needles to stay in place. The skin was then cut opened from the abdominal area, the dorsal area, and extremity area of the frog. The parasite found from body cavity then was observed macroscopically with magnifier and afterward it was put into physiological NaCl solution as a sample's preservative and then labeled the date of sampling.

The discovered *Acanthocephala* were then colored with *Semichen-Acetic Carmin* method and then observed with microscope.

Results

Based on the result of this research from 50 samples of frogs taken from rice field, fish pond, or muddy swamps in Surabaya on May – June 2018, there were 28 *Acanthocephala* worms in body cavity (abdomen) with prevalence of 56% and according to the prevalence category of parasite referencing to Williams and Williams (Williams and Williams, 1996) the result was included in the category of *frequently*.

Discussion

Based on the result of this research there are 28 samples that were positive with *Acanthocephala* in body cavity of *Fejervarya cancrivora*.

On the raw samples to be examine, *Acanthocephala* has the anterior part latch onto ovary of the hosts and is bigger than the posterior part, while in the microscopic slide stained with *Carmin*, the anterior hooked proboscis is rounded shape with a lot of hooked attach to the proboscis. Although the proboscis have a basic similiarity, the *Acanthocephala* proboscis that were found seem to have variation in size and its rounded shape. To measure the accurate length of *Acanthocephala* is difficult because their body length when attach to their host compare to when they were released from their host are different. The differences in length of *Acanthocephala* may be caused by different species of host and/or habitat of the host or may be different predilection of each different *Acanthocephala* species, which in this study was found in body cavity. The *Acanthocephala* were found in the body cavity, some were found encapsulated as a cyst while some as worm latch on to the tissue, but only worm was used for this research further observation.

In *Acanthocephala* life cycle, there are intermediate host, paratenic host, and definitive host. Frogs can act as all of those different type of hosts, depending on which stages it is developing and where it is developing. The first intermediate host of *Acanthocephala* is arthropod, usually crustacean. The definitive host becomes infected upon ingestion of intermediate hosts containing infective cystacanth and when eaten by a vertebrate that is an unsuitable definitive host, it can penetrate the gut and encyst in some location where they survive without further development. As *Fejervarya cancrivora* is a crab-eating frog, it has a high possibility getting infected from the crab they consumed. All vertebrate classes could serve as definitive host of *Acanthocephala* such as fishes, bird, amphibians, reptiles, dog, swine, rat, including human. Paratenic host happened because the cystacanth was consumed by an unsuitable definitive host in which it would reside without any further development until it is eaten by a suitable definitive host and continue is further developmental stage into mature worm. According to Kennedy (Kennedy, 2006) paratenic hosts are to be found in many *Acanthocephala* life cycles. On reaching such host, the cystacanth may partially evert and move into the body cavity of the vertebrate, where it is often to be found attached to the mesenteries and/or partially encysted. So there is possibility that the *Acanthocephala* found in the body cavity in this research is in form of cystacanth.

As this research was conducted with animal who also spend its live around water, water contamination is also considered to be a source. If water source seem to have frog or tadpole in it, it could potentially spread *Acanthocephala* infection to other animal or human if the water is used for drinking and isn't processed properly.

The *Acanthocephala* that were found in body cavity in this study had prevalence of 56% from the samples that were used and there was no specific symptoms or special characteristic in particular of the frogs in which it were found..

It is important to do sampling or data collectiong for the frog that will be sold in the market locally or internationally to prevent transmission of *Acanthocephala* or any other hemlinthiasis and there needs to be a supervision with standardized rule for the industry as guarantee for the costumer or everyone that is involved in the industry.

Conclusion

Based on the result of this research there are 28 positive samples infected by *Acanthocephala* that were found in body cavity in this research, with the prevalence 56 % and was categorized as *frequently*.

Acknowledgment

Not forgetting the high appreciation given to colleagues and parties involved in this study and gratitude for the basis of the development of knowledge given.

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