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Research Article

Value of prevalence and intensity of ectoparasite infesting *Litopenaeus vannamei*

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ABSTRACT

The objective of this research is to calculate prevalence values, ectoparasites intensity values, and to identify the genome of the ectoparasites that infested the Vannamei shrimp (*Litopenaeus vannamei*) of which is being cultivation in soli, concrete and plastic pond. The methods that being use in this research is surveys of quantity of sample inside a population. Ectoparasites prevalence that infested Vannamei shrimp gets 95% inside soil pond which is almost always. Ectoparasites prevalence are at 73,33% inside plastic ponds which is usually, and at 94,17% inside concrete pond which is almost always. Ectoparasites intensity inside soil pond 69,08 zooid/tail which is considered severe. Plastic pond 3,02 zooid/tail which is considered mild and 60,96 zooid/tail for concrete pond which is considered severe.

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INTRODUCTION

Vannamei shrimp are one of the most sought after to be breed in captivity. This shrimp also have few other advantages than other prawns. The shrimp have a high survival rate, quick rate of growth, and a huge demand on the market every year. Vannamei shrimp raised in production up to 380 tons yearly between years 2010-2014 (Hendrajat *et al.*, 2007). Vannamei shrimp can be cultivated on the basis of different ponds is soil, concrete and plastic ponds. These three different ponds have an impact on the handling process during cultivation. In soil ponds are usually often carried out water filling because the soil has high porosity properties. Water filling still relies on sea tides (Utojo, 2015). So the cultivation process depends on the state of nature. The base and walls of the plastic and concrete ponds are solid. The advantages of this pond are the absence of clasps and water plants that have the potential to cause high water ammonia due to decay (Atmomarsono *et al.*, 2014).

The base and walls of concrete and plastic ponds have the potential to place ectoparasites especially protozoa groups. In case of heavy infestation *Zoothamnium* can cause death and growth of shrimp hampered (Triyanto and Isnansetyo, 2004). Based on the above description it is necessary to research the prevalence, degree of infestation and ectoparasites that infest the Vannamei shrimp cultivated on the bottom of different ponds.

MATERIALS AND METHODS

a.Place and Time

The study was carried out in January-March 2018. The sampling of Vannamei shrimp (*Litopenaeus vannamei*) was done in 3 locations is soil, concrete and plastic pond.

b.Sampling

Taking sampling in the morning. Previously measured water quality with parameters of temperature, salinity, pH and DO. The number of ponds taken refers to Cameron (2002), which is 5% of all shrimp farming ponds that produce. The number of samples taken as many as 30 tail with dense stocking> 1000 tail / pond.

c.Sample Observation

Samples that have been obtained are then examined at Airlangga University PSDKU Laboratory in Banyuwangi. The examination begins by weighing the sample and then measuring the length. Performed scrapping on the tail, body surface, foot path, swimming legs and gills. The scrapping results were observed under a microscope with magnification of 100X and 400X. The ectoparasites was then identified and calculated prevalence and intensity.

d.Analysis of Results

Based on the calculation of ectoparasites that infest the Vannamei shrimp. Then do a descriptive analysis by doing the calculation of prevalence and intensity (Mamani *et al.,* (2004)

$$\text{Prevalence} = \frac{\sum \text{shrimp infested ectoparasite}}{\sum \text{shrimp examined}} \times 100\%$$

$$\text{Intensity (zooid/tail)} = \frac{\sum \text{parasite found}}{\sum \text{infested shrimp}}$$

RESULTS AND DISCUSSION

a. Ectoparasite Identification

The identification of ectoparasites obtained the results of three ectoparasite genera *Zoothamnium*, *Epistylis* and *Voreticella* are presented in Fig. 1.

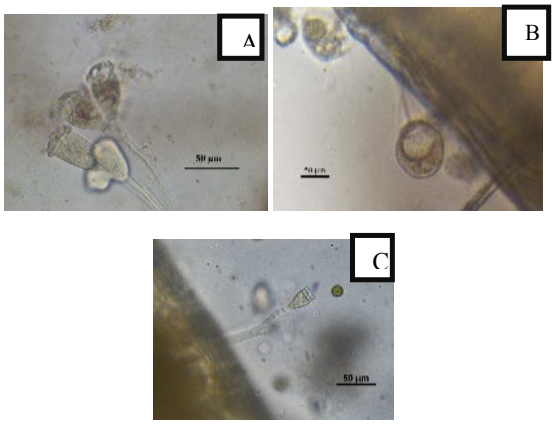

Fig. 1. Ectoparasite observation result (A). Colony *Zoothmanium* (B). *Vorticella* (C). *Epistylis*

1). Zoothmanium

Zoothamnium colony seen marked in one stalk there are 2-31 zooid. Stalks are contractile in length and shortened, *Zoothamnium* colony is shaped like an inverted bell and is translucent (transparent). Cilia is seen not so clearly located in the anterior part, there is spasmonema, micronucleus and makronucleus not seen in observation. This is in accordance with the opinion of Lynn (2007) and Kudo (1954) is *Zoothamnium* genus live solitary or colonized, shaped like an elongated bell, mempunyaai mikronukleus and makronukleus, contractile vakuola, habitats in freshwater and sea.

2). Vorticella

Vorticella looks clear, solitary characterized by a single stalk there is one zooid. The stalk is contractile or may be elongated and shortened. Zooid is shaped like an inverted bell. Cilia is seen not so clearly located anteriorly, there is spasmonema, micronucleus and makronucleus not seen in observation. zooid has length 67,24 µm, zooid width 58,60 µm and stalk length 16,02 - 94,08 µm, live in marine waters

This is in accordance with Kudo's recorders (1954); Lynn (2007) and Kabata (1985), namely the genus *Vorticella* has a contract (stalk) is contractile or can be elongated and shortened. A solitary characterized by a single stalk (stalk) there is only one zooid. Have micronucleus, macronucleus, yellowish or greenish and habitat in freshwater, brackish and marine.

3). Epistylis

Epistylis looks clear, zooid shaped like an inverted bell. Visible solitary (zooid) marked in one stalk (stalk) there is one zooid. Visible colonized marked with one stalk (stalk) there are more than 2 zooid. Stalks are non-contractile that can not be elongated and shortened. This is in the opinion of Kabata (1985) and Lynn (2007) that has stalks that are non-contractile or non-elongated and short, have zooids of up to 600 µm, relatively short macronucleus, egg-shaped zooids, conical or bell-like, solitary (zooid) or colony, having macronucleus, contractile vacuoles, living in fresh and marine waters.

b. Result of Calculation of Prevalence and Intensity

Tabel 1. Prevalence and intensity of ectoparasites in soil, plastic and concrete ponds

Type of Pond	Infested shrimp (tail)	Number of ecto. (zooid)	P (%)	Category[3]	I (zooid/tail)	Category[3]
Soil (N = 60)	57	3938	95	*almost always*	69,08	Heavy
Plastic (N = 60)	44	133	73,33	*Usually almost always*	3,02	Light
Concrete (N = 120)	112	6828	93,33		60,96	Heavy

Information : 1. P = prevalence
2. I = intensity
3. [3]William *and* Williams (1996)

DISCUSSION

The highest prevalence and intensity of the three types of ponds are found in soil and concrete ponds. The lowest prevalence and intensity are found in plastic ponds. The prevalence of soil and concrete ponds was 95% and 94.17% were in the almost always category. This is probably caused by the porosity of the soil, which has an impact on the inability of the soil to retain water in the aquaculture pond. Need to do water entry into the pond cultivation. Meanwhile, the water that is entered is not treated first so that the water quality depends on the state of nature. Ectoparasites can enter through water taken from the natural.

The high prevalence of concrete ponds is likely to be due to the walls and solid bottom of the ponds at potentially place of ectoparasite attachment *Zoothamnium*, *Vorticella* and *Epistylis*. This is in accordance with the opinion Peng (2013) and Lynn (2007) which states that ectoparasit *Zoothamnium*, *Vorticella* and *Epistylis* attached to the substrate of the wall and bottom of the pond. In addition, the high density of stocking in a concrete ponds of 250 heads/ m^2 is likely to have limited shrimp spaces affecting friction between shrimp so that ectoparasite contagion can occur rapidly.

The high intensity of soil and concrete ponds may be due to the same host group of crustaceans and the same predilection of ectoparasites on the body surface of Vannamei shrimp. The low intensity values in plastic ponds

may be caused by periodic replacement of plastics used so that ectoparasites attached to the bottom and walls of plastic ponds wasted.

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