Occurrance of Ectoparasites in Mud Crab (Scylla serrata) and White Shrimp (Litopenaeus vannamei)

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Occurrance of Ectoparasites in Mud Crab (*Scylla serrata*) and White Shrimp (*Litopenaeus vannamei*)

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Abstract

The aim of this study was to compare the prevalence and intensity of ectoparasites which infest mud crab (*Scylla serrata*) and white shrimp (*Litopenaeus vannamei).* The prevalence of ectoparasite infestation in mud crab was 92.5% with an intensity of 801.18 per sample while the infestation in white shrimp showed 62% with the intensity of 19.98 per sample. It could be concluded that the ectoparasites were found in mud crab more frequently than in white shrimp.

Key words: ectoparasites, mud crab, white shrimp

Mud crab (*Scylla serrata*) and white shrimp (*Litopenaeus vannamei*) are becoming a commodity that featured in the export field (Aji and Supriono, 2018; Hardiyanti *et al.*, 2018). One agent of disease-causing pathogens is ectoparasite. It can attack both mud crab (*S. serrata*) and white shrimp (*L. vannamei*) (Lavansyah *et al.*, 2012; Novita *et al.*, 2016). The aim of this study was to compare the prevalence and intensity of ectoparasites which infest these two hosts.

Materials and Methods

Materials used in this study were samples of mud crab and white shrimp. A total of 80 of mud crabs having 250 grams weight and 15cm width were taken from mud crab's enlargement pond in the District of Ujung Pangkah, Gresik, Indonesia. 150 white shrimps as samples were obtained from Tanjangawan village, District of Ujung Pangkah, Gresik, Indonesia with 10-12 cm in size.

Methods used to diagnosis the ectoparasite were native methods (Lom and Dikova, 1992). Ectoparasites were observed on the surface of the body, swimming legs, and gills of mud crab and white shrimp.

The calculation for prevalence and intensity was done as per the fomula mentioned below :

$$\text{Prevalence} : \frac{\text{Number of samples infected}}{\text{Number of samples examined}} \times 100\%$$

$$\text{Intensity} : \frac{\text{Number of parasites found}}{\text{Number of samples infected}}$$

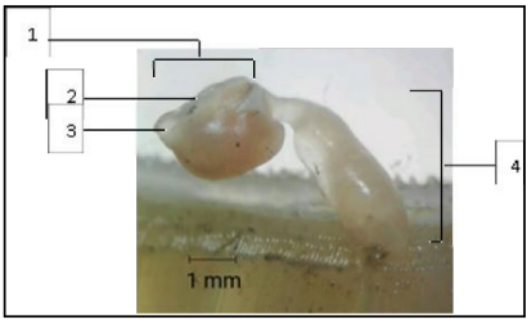

Fig 1. *Octolasmis* infested the mud crab's gill (40x)
1. Capitulum 2. Scutum 3. Tergum 4. Penducle

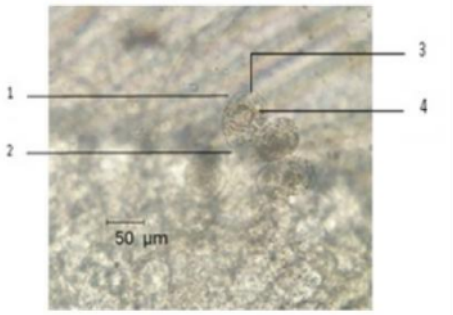

Fig 2. *Zoothamnium* infested white shrimp (*Litopenaeus vannamei*) (400x)
1. The food vacuole; 2. Stalk; 3. Epistomial; 4. Peristomial

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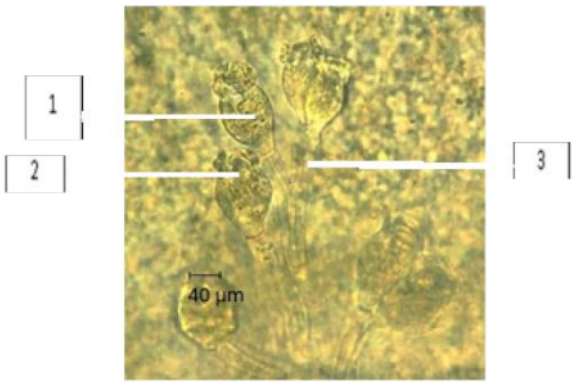

Fig 3. *Epistylis* infested the mud crab and white shrimp (400x)
1. The food vacuole; 2. contractile vacuole; 3. Stalk

Results and Discussion

From the observation, ectoparasites such as *Octolasmis* (Fig 1), *Zoothamnium* (Fig 2) and *Epistylis* (Fig 3) were found infested in mud crabs; while *Zoothamnium* and *Epistylis* were found infested in white shrimps.

Based on observations conducted on 80 mud crabs, 74 (92.5%) mud crabs were found infested with ectoparasite, while from 150 white shrimps, 93 (62%) were infested by ectoparasites. The prevalence of ectoparasites is presented in Table I.

Based on the observations conducted, the intensity of ectoparasites in mud crab was 801.18 in number per sample. The intensity of ectoparasites in white shrimp was 19.98 per sample. The intensity of ectoparasites in mud crab and white shrimp is presented in Table II.

The high intensity of ectoparasites infestation in mud crab and white shrimps was caused by the source of water used that comes from river which flow directly in to the pond without any treatment. The absence of some treatment such as a water filtration system made the entry of the ectoparasites and other pathogenic agents easy in ponds (Nurlaila *et al.,* 2016). Traditional aquaculture systems also did not apply water changes, hence decrease in water quality, would cause rapid development of ectoparasites.

Several studies had been conducted on the occurrence of ectoparasite infection in white shrimp and mud crabs. Farras *et al.,* (2017) found the prevalence of ectoparasites in the intensive-shrimp-culture system was 57.5% and 56.% in the extensive-shrimp-culture system, while Maldini *et al.*, (2017) found Chilodonellosis in the mud crab (*Scylla serrata*). Mushtaq and Mustaquin (2009) found several species of *Octolamis* on the gills of mud crab and the infestation of *Epistylis* sp, *Zoothamnium* sp, *Vorticella* sp, and *Trichodina* sp. in white shrimp (*Litopenaeus vannamei*) (Putra *et al*., 2018).

Sessile protozoans, like *Epistylis,* interfered with the gas exchange by blocking respiratory surfaces of the eggs and larvae, especially if found in high numbers (Lavilla and de la Peña. 2004). Epibiosis organism such as *Epistylis* sp. flourishes in low dissolved oxygen conditions. Once infested, cotton wool like growth attaches to the body as well as appendages and disrupt mobility and feeding (Jithendran *et al*., 2010). However, little is known about the ecological relationship between farmed fish and *Epistylis* sp. This sessile peritrich is often described as an epibiont on aquatic organisms, although studies have shown deleterious effects by the ciliate on their hosts.

Table I. The prevalence of ectoparasites at mud crab and white shrimp

Sample	Number of Samples	Ectoparasites (Phylum)						Total number of samples infested	Prevalence (%)
		Octolasmis		Zoothamnium		Epistylis			
		A	B	A	B	A	B		
Mud Crab	80	71	88.75	50	62.5	69	86.25	74	92.5
White Shrimp	150	-	-	47	31,33	76	50.66	93	62

A: The number of samples infested with ectoparasites B: Prevalence (%)

Table II. The intensity of ectoparasites in mud crab and white shrimp

Sample	Number of Samples	Ectoparasites (Phylum)						Total sample infested	Average Intensity (number per sample)
		Octolasmis		Zoothamnium		Epistylis			
		A	B	A	B	A	B		
Mud Crab	80	71	12.62	50	34.5	69	821.25	74	801.18
White Shrimp	150	-	-	47	15.26	76	15.01	93	19.98

A: Samples of infested ectoparasites B: Intensity of ectoparasites (number per sample)

Epibiosis has a spatially close association between two or more organisms belonging to the same or different species. Through direct and indirect interactions, this association has major effects on the species involved and on community dynamics (Wahl and Mark, 1999). Epibiotic associations between crustaceans and ciliates are very common, since the calcified surface of the crustaceans functions as a semi-permanent substrate, providing an optimal habitat for epibionts ciliates, especially in those areas where other substrates are not suitable for long-term colonization (Bozkurt and Genc, 2009). This epibiotic associations also occurs between decapod crustaceans and stalked barnacle *Octolasmis*, where this interaction does not seem to be species-specific (Machado *et al*., 2013). Many cases of *Octolasmis* infestation have been reported in parasites infested the mud crabs (*S.serrata*), sand lobster, bamboo lobster, *Portunus sanguinolentus* and several species of crabs (Herlinawati *et al*., *loc. cit*; Yusgita *et al*., 2019; Li *et al*., 2015; Machado *et al*., *loc. cit*).

Infestation of *Zoothamnium* also forms the epibiotic association. *Zoothamnium* sp. might have contributed towards respiratory difficulties, relative weakness and greater susceptibility of prawns to cannibalism, leading to early death also inhibits egg hatching of *Penaeus monodon* (Mustafa *et al*., 1997; Tompo and Idris, 2016)

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Antiviral Activity of Ethanolic Extract of Srikaya Seeds (*Annona squamosa L.*) Against *Avian Influenza* Virus

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Abstract

Drug resistance against influenza viruses have brought the attention of public concern. The development of new antiviral was needed. This study aim to determined the antiviral activity of ethanolic extract of srikaya seeds (EESS) on *Avian influenza* (AI) when inoculated in embryonated chicken eggs by hemagglutination test. Determination of AI virus titers was carried out by chorioallantoic test. The results showed that the percentage of antiviral activity of the extract at 0.35µg/ml was 59.72%, while the extractat 0.15µg/ml and 0.25µg/ml was 33.33% and 43.06%, respectively. In conclusion, 0.35µg/ml EESS is the most effective concentration that can inhibit the AI virus.

Key words: Antiviral activity, *Avian influenza,* ethanolic extract, srikaya seeds

Avian Influenza is acute contagious disease and highly infectious in poultry (Sharif *et al.*, 2014). H5N1 strains outbreaks in poultry is reported in 60 countries and also caused 622 human infections (Huang *et al.*, 2013)as in chicken and zebra finch, and this repertoire has been shaped through lineage-specific duplications. Genes that are responsive to influenza A viruses were identified using the lung transcriptomes of control ducks and ones that were infected with either a highly pathogenic (A/duck/Hubei/49/05.

Avian influenza virus can mutate accord-

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