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Isolation of the Fungus on Mantis shrimp (*Squilla mantis*) Trafficked at the Fish Quarantine Station for Quality Control of Fishery Products Safety (SKIPM) Pekanbaru

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Abstract

Mantis shrimp as one of the foods that come from the sea and ponds is not immune from disease infection, one of which is infection by fungi. Mantis shrimp (*Squilla mantis*) is one of the crustaceans that has a physical shape resembling a praying mantis. This research was conducted on January–February, 2022 at the Fish Quarantine Station for Quality Control and Safety of Fishery Products (SKIPM) Pekanbaru, Riau. The research method used is the survey method. Mantis shrimp samples came from Bengkalis which were trafficked at SKIPM Pekanbaru. The results of the incubation in the first isolation stage that have been overgrown with fungi, then the purification stage is carried out. The fungus that grows is carried out in the staining stage to make it easier to observe the fungus under a microscope. Furthermore, the identification of fungi in mantis shrimp using a microscope and referring to the book Identifying Filamentous Fungi. The results showed that there were 2 types of fungi, namely *Fusarium* sp. and *Penicillium* sp.

1. Introduction

Mantis shrimp as one of the foods derived from the sea and ponds does not escape from disease infection, one of which is fungus in shrimp. Mantis shrimp (*Squilla mantis*) is one of the crustaceans that has a physical shape resembling a praying *mantis (manthis*) (Ashari *et al.*, 2016). The regional name for this shrimp is pangko, ketak shrimp, or grandma's shrimp. The term ronggeng shrimp is used for trade names and names in Indonesian, while in Australia mantis shrimp is known as "*prawn killers*" (Situmeang *et al.*, 2017)

Various ways to overcome diseases in shrimp have been carried out by spreading chemical drugs and antibiotics, but currently these actions have been strictly prohibited from being used because they can have an impact on environmental pollution (Muliani *et al.*, 2016). The organisms that usually attack shrimp generally come from the group of fungi, bacteria, viruses, parasites and other invertebrate animals (Kasan *et al.*, 2018; Megawati *et al.*, 2017)

fungus are simple plants that do not need light to grow, but are able to eat organic matter to get their energy. The type of fungus found in shrimp, especially in the gills, is the type of *Fusarium* sp. This fungus is a fungus that is very responsible for fusariosis in shrimp. This disease usually infects shrimp in juvenile stadia to adult-sized shrimp (Rianto, 2019).

Water quality is an important factor, if you do not have a good quality it will have some adverse impacts on shrimp such as decreased appetite, slow growth to shrimp that are easily attacked by diseases (Samura *et al.*, 2018).

2. Methodology

2.1. Time, Place and Materials

This research was conducted in January-February 2022. The research method used is the survey method. The mantis shrimp sample came from Bengkalis which was passed through at SKIPM Pekanbaru.

2.2. Identification Method

The method uses conventional techniques. Harrow & Feltham (2003), shrimp samples were dissected by separating the head and body of the shrimp, then the meat was taken from the body and head of the shrimp, cut the desired parts such as gills, eyes, swimming leg muscles, walking. leg muscles, uropods, antennae using surgical scissors, then placed on the PDA media using tweezers. The medium containing the sample was put into an incubator to be incubated at 31°C for 5-7 days. After that you will see the fungal colony and the color of the fungi colony (Natalia, 2019). Purification using slide culture method. petri dishes, cotton buds, toothpicks, aquades, slides, cover slips, PDA media. fungi staining using lactophenol blue. Lactophenol blue solution was dripped on a slide, after that the sample was transferred to a glass object, and closed using a glass cover at an angle of 45° to prevent bubbles from forming during navigation. Clear polish is applied to the edges of the cover glass, this is done so that the cover glass and object glass are united and do not shift during the inspection (Natalia, 2019).

The identification of the fungus was carried out in two stages. The first stage is macroscopic observation of the color and shape of the colony. The second stage was observing the morphology of the fungus by looking at the shape of the spores and stolons under a microscope using 10x40. Identification of fungi is carried out using the book Identifying Hairy Fungus Clinical Laboratory Handbook.

3. Result and Discussion

The results of the types of fungi found in mantis shrimp are outlined in Table 1. the results of morphological observations of fungi growing in PDA media after being incubated at a temperature of 30° C for 5-7 days obtained 2 types of fungi, namely *Fusarium* sp and *Penicillium* sp.

Table 1. Results of fungal identification on mantis shrimp

Target Organs	Types of Fungi	Charateristics of the Colony
Brain	*Penicillium* sp.	Texture: Chipped Color: greenish ash
Walking legs muscles	*Fusarium* sp.	Texture: Chipped Color: White
	Penicillium sp.	Texture: Chipped Color: white
Swimmerets muscles	*Penicillium* sp.	Texture: Fine powder Color: Green
Eye	*Penicillium* sp.	Texture: Fine powder Color: Green
Antenna	*Penicillium* sp.	Texture: Fine powder Color: Green

Based on the results on Table 1. two types of fungi were found in mantis shrimp that passed through SKIPM Pekanbaru. The fungus *Penicillium* sp found in whole component of shrimp namely the brain, walking leg muscles, swimming muscles, eyes and antennae. While *Fusarium* sp is found in 4 components except in the brain.

Penicillium sp. from the results of observations of the morphological characteristics of fungi on PDA media during the 3-7 days of the incubation period, it can be seen that the colonies *of Penicillium* sp fungi are generally green (Figure 1).

The results of microscopic observations with an enlargement of 10x40 obtained images of *Penicillium* sp. showing the presence of *conidia*, *phialides*, and *hypa* (Megawati, 2017) (Figure 2).

Penicillium sp is an Ascomycota fungus which is saprophytic because it can live on food debris. This fungus requires foodstuffs in the form of organic substances to live, in addition to certain environmental factors or circumstances, such as temperature

(Pamungkas & Khasani, 2016). Shrimp feed contains nutrients that can support the life of microorganisms. The presence of *Penicillium* sp fungus in cultured shrimp is likely due to their living environment that does not support it properly to avoid fungus.

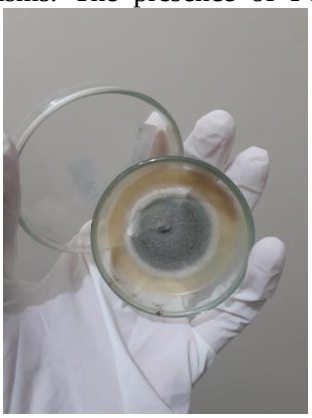

Figure 1. Colony of *Penicillium* sp.

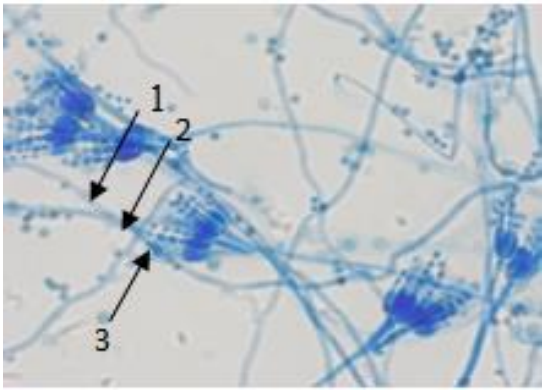

Figure 2. *Penicillium* sp.
Description: 1. Conidia, 2. Sterigma, 3. Metula

Fusarium sp. is a fungus that is very responsible for fusariosis in shrimp. The disease commonly infects shrimp on juvenile stadia up to adulthood. The appearance of this fungus is caused by poor land preparation at the time before the cultivation business began. This disease usually affects shrimp gills, walking leg muscles, swimming leg muscles, as well as shrimp tails (Rianto, 2019).

The fungus *Fusarium* sp macrocopically has the characteristics of a colony of white and cotton texture. Microcopically, this fungus has characteristics, namely there are sickle-shaped macroconidia with three bulkheads and microconydia of one to two ovoid cells . *Fusarium* sp fungus has 3 reproductive organs, namely microconidia (consisting of 1-2 cells), macroconidia (3-5 septa), and chlamydose (swelling of hyphae) (Natalia *et al.*, 2019).

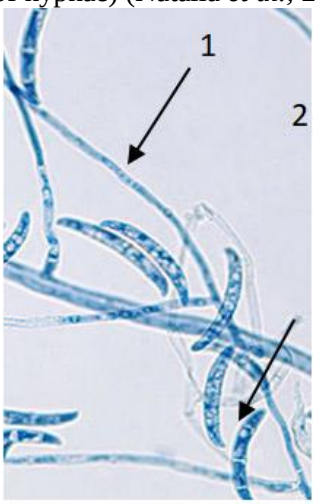

Figure 3. *Fusarium* sp.
Description: 1. Mycelium, 2. Macroconida

4. Conclusion

Based on the identification results of 8 samples of mantis shrimp (*Squilla mantis*) found 2 types of fungi that infect mantis shrimp, namely the fungus *Penicillium* sp. and the fungus *Fusarium* sp. It is necessary to carry out genetic identification to find out the species of fungi that exist in mantis shrimp, whether new species or species that already exist in the world

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