

PREVALENCE AND INTENSITY OF THE PARASITE *Octolasmis* spp. IN MUD CRABS (*Scylla* sp.) IN SOUTH SULAWESI

Maria Dominika Mazzarello¹, Ulfah S. Kuba², Ramli², Marlina Achmad³,
Nunun Ainun Putri Sari Banun Kaliky¹, Dian Novita Sari¹

¹Marine and Coastal Aquaculture Study Program, Faculty of Vocational Studies, Hasanuddin University, Jl. Perintis Kemerdekaan KM 10, Tamalanrea, Makassar, South Sulawesi, Indonesia

²Animal, Fish and Plant Quarantine Center of South Sulawesi, Jl. Perintis Kemerdekaan KM 12, Kapasa, Tamalanrea, Makassar, South Sulawesi, Indonesia

³Aquaculture Study Program, Faculty of Marine Sciences and Fisheries, Hasanuddin University, Jl. Perintis Kemerdekaan KM 10, Tamalanrea, Makassar, South Sulawesi, Indonesia

Email: diannovitas@unhas.ac.id

ABSTRACT

Mud crab (Scylla sp.) is a high-value fishery commodity in South Sulawesi. However, their presence is threatened by ectoparasite infestation, Octolasmis spp., which has the potential to reduce the health condition, quality and economical value of mud crabs. This study aims to identify Octolasmis species and to determine the prevalence and intensity of Octolasmis spp. infestation in mud crabs from South Sulawesi. The research was conducted in August-September 2025 using a purposive sampling of submitted specimens with a total of 30 mud crabs from companies that submitted specimens for analysis to the Animal, Fish and Plant Quarantine Center of South Sulawesi. Observations of the Octolasmis spp. were conducted macroscopically and microscopically. From the observed samples, two types of Octolasmis spp. have been found infecting mud crabs in South Sulawesi, namely Octolasmis cor and Octolasmis angulata. The prevalence and intensity of O. cor were 26% and 138 ind/crabs, while O. angulata had prevalence and intensity values of 43% and 53 ind/crabs, respectively. Parasitic infestation by Octolasmis spp. in mud crabs in South Sulawesi is considered common and severe. Therefore, environmental management and a good aquaculture management are needed to reduce infestation risks and to prevent economic losses.

Keywords: carina, crab, ectosymbionts, ectoparasites, peduncle

ABSTRAK

Kepiting bakau (*Scylla* sp.) merupakan komoditas perikanan bernilai ekonomi tinggi di perairan Sulawesi Selatan. Namun, keberadaannya terancam oleh infestasi ektoparasit *Octolasmis* spp., yang berpotensi menurunkan kondisi kesehatan, kualitas dan nilai ekonomi kepiting bakau. Penelitian ini bertujuan untuk mengidentifikasi jenis parasit *Octolasmis* spp. serta menentukan tingkat prevalensi dan intensitas infestasi parasit *Octolasmis* spp. pada kepiting bakau (*Scylla* sp.) di Sulawesi Selatan. Penelitian dilakukan pada bulan Agustus-September 2025 menggunakan metode pengambilan sampel secara *purposive sampling* sebanyak 30 ekor kepiting bakau dari perusahaan yang mengajukan permohonan analisis di

Balai Besar Karantina Hewan, Ikan dan Tumbuhan Sulawesi Selatan. Pengamatan *Octolasmis* spp. dilakukan secara makroskopis dan mikroskopis. Dari sampel yang diamati, ditemukan dua jenis *Octolasmis* spp. yang menginfeksi kepiting bakau di perairan Sulawesi Selatan, yaitu *Octolasmis cor* dan *Octolasmis angulata*. Nilai prevalensi dan intensitas *O. cor* masing-masing sebesar 26% dan 138 ind/ekor, sedangkan *O. angulata* memiliki nilai prevalensi dan intensitas masing-masing sebesar 43% dan 53 ind/ekor. Infestasi parasit *Octolasmis* spp. pada kepiting bakau (*Scylla* sp.) di perairan Sulawesi Selatan tergolong sering dan parah. Oleh karena itu, pengelolaan lingkungan dan praktik budidaya yang baik diperlukan untuk menekan risiko infestasi dan mencegah kerugian ekonomi.

Kata Kunci: *carina*, *ectosymbionts*, ektoparasit, kepiting, *peduncle*

INTRODUCTION

Mud crab (*Scylla* sp.) is a high-value fishery commodity with stable demand in both domestic and international markets. The high demand for mud crabs is influenced by their high nutritional content and delicious taste (Herlinawati, 2017). Indonesia is one of the world's leading producers of mud crabs, with a production of 25.865 tons in 2021, or about 8,2% of the total global production, which is dominated by the species *Scylla serrata* and *Scylla olivacea* (KKP, 2023). At the regional level, South Sulawesi is one of the important production centers because it is supported by a vast mangrove ecosystem as a natural habitat and cultivation location.

Increased production of mud crabs, both through catch and cultivation, faces various threats, one of which is parasite attacks (Handayani & Rozikin, 2019). Several parasites that commonly infect mud crabs belong to the protozoa group, such as *Vorticella* sp., *Zoothamnium* sp., and *Epistylis* sp., as well as the Arthropoda group, such as *Octolasmis* spp. (Irvansyah *et al.*, 2012). The *Octolasmis* spp. belongs to the *copepod* group that attaches to the gills and other parts of the host's body, thereby interfering with respiration and metabolism. Parasite infestation in crustaceans can cause physiological disorders, decreased productivity, and increased mortality. At high levels of infestation, this condition has the potential to reduce productivity and cause economic losses (Yap *et al.*, 2015).

In parasite epidemiology studies, prevalence is defined as the percentage of infected individuals in a population, while intensity refers to the number of parasites infecting each host (Hadiroseyani, 2010; Hakim *et al.*, 2019). Several studies in Indonesia have shown a relatively high incidence of *Octolasmis* spp. infestation. A study in Aceh reported a prevalence of up to 63% (AS *et al.*, 2025), while research in Tomini Bay showed prevalence of up to 60% in some locations (Suherman *et al.*, 2022). This high prevalence indicates that the parasite is widespread in Indonesia's tropical waters.

Prevalence and intensity parameters are important for describing the level of parasite threat to a population and determining the level of parasite infection. Although reports of *Octolasmis* spp. infestations have been found in several regions of Indonesia, information on the type, prevalence, and intensity of *Octolasmis* spp. infestations in mud crabs in South Sulawesi is still limited. Therefore, this study aims to identify the type of *Octolasmis* spp. that infects mud crabs (*Scylla* sp.) and determine the prevalence, intensity, and infection levels in South Sulawesi.

RESEARCH METHODS

Time and Place

This research was conducted at the Laboratory of the Animal, Fish and Plant Quarantine Center of South Sulawesi during the period of August-September 2025. The samples used were mud crabs (*Scylla* sp.) from several companies and sourced from several regions in South Sulawesi such as Pangkep, Bone, Pinrang, Malili, Palopo and Siwa.

Mud crabs sampling

Samples of mud crabs (*Scylla* sp.) were obtained from companies that submitted request for analysis to the Animal, Fish, and Plant Quarantine Center of South Sulawesi. A total of three samples were taken from each company. The sampling method was random sampling. During the period of August-September 2025, the number of samples studied was 30 mud crabs from 10 companies. The mud crab samples were either wild-caught or cultivation activities and were in the adult crab's stage. These crab samples were taken alive, and their claws and legs were tied with raffia rope to prevent them from escaping.

The mud crabs were killed by piercing their abdomens with surgical scissors to facilitate dissection. The crab's carapaces were dissected and opened to observe the gills. Then, the gills were cut and transferred to a petri dish using tweezers to separate the gills and *Octolasmis* spp.

Parasite Observation

Observation of *Octolasmis* spp. was carried out using two methods, namely macroscopic and microscopic observation. Macroscopic examination of *Octolasmis* spp. was carried out by separating the parasites and the gills of mud crabs using tweezers. Then, the body shape, color, and number of parasites in the gills of each crab sample were observed manually. Microscopic examination was carried out by placing the *Octolasmis* spp. on a glass slide and dripping with distilled water to prevent them from drying out. After that, the samples were observed using a Primo Star ZEISS light microscope connected to a computer. The ZEN 2.3 Lite application was used for observation under the microscope. The glass slide was placed on the microscope stage and observed at 40× magnification. The examination results were documented using the ZEN 2.3 Lite application and a cellphone camera.

Calculation of Parasite Prevalence and Intensity

Prevalence is information about the level of disease in a population at a given time (Handayani & Rozikin, 2019). Prevalence or frequency of occurrence is the percentage of mud crabs infected with a disease out of the total number of mud crabs studied. The results of calculating the prevalence of the *Octolasmis* spp. that infects mud crabs (*Scylla* sp.) are grouped into several categories (Table 1).

Table 1. Parasite prevalence categories

No	Prevalence (%)	Category	Description
1.	100-99	<i>Always</i> (selalu)	Very severe infection
2.	98-90	<i>Almost always</i> (hampir selalu)	Severe infection
3.	89-70	<i>Usually</i> (biasanya)	Moderate infection
4.	69-50	<i>Frequently</i> (sangat sering)	Infection is very frequent
5.	49-30	<i>Commonly</i> (umumnya)	Common infections
6.	29-10	<i>Often</i> (sering)	Infection often
7.	9-1	<i>Occasionally</i> (kadang)	Infection sometimes
8.	<1-0.1	<i>Rarely</i> (jarang)	Rare infection
9.	<0.1-0.01	<i>Very rarely</i> (sangat jarang)	Infection is very rare
10.	<0.01	<i>Almost never</i> (hampir tidak pernah)	Infection never

Source: Williams and Williams, 1996

The prevalence of infected mud crabs was calculated using the following formula.

$$Prevalence (\%) = \frac{\text{Number of infected crabs}}{\text{Number of crabs observed}} \times 100$$

Parasite intensity is the number of parasites that attack an organism within a certain period (Yulanda *et al.*, 2017). The results of calculating the parasite intensity of *Octolasmis* spp. infecting mangrove crabs (*Scylla* sp.) were grouped into several categories (Table 2). Parasite intensity was calculated using the following formula.

$$Intensity (ind/crabs) = \frac{\text{Number of parasites infecting}}{\text{Number of infected crabs}}$$

Table 2. Parasite intensity categories

No	Intensity (Ind/crabs)	Category
1	<1	<i>Very light</i> (sangat rendah)
2	1-5	<i>Light</i> (rendah)
3	6-50	<i>Moderate</i> (sedang)
4	51-100	<i>Heavy</i> (parah)
5	>100	<i>Very heavy</i> (sangat parah)
6	>1000	<i>Super infection</i> (super infeksi)

Source: Williams and Williams, 1996

Data analysis

The data obtained was the number of *Octolasmis* spp. and the number of infected crabs. The data was then tabulated using Ms. Excel and analyzed using descriptive methods. The data is presented using figures and tables.

RESULT AND DISCUSSION

Types of *Octolasmis* spp. Parasites in Mud Crabs (*Scylla* sp.)

The types of *Octolasmis* parasites found infecting mud crabs in South Sulawesi are *Octolasmis cor* (Figure 1a) and *Octolasmis angulata* (Figure 1b). Based on observations, *Octolasmis* parasites were only found on the gills of crabs. This is consistent with the research by Irvansyah *et al.* (2012) that gills are organs rich in nutrients and are only covered by thin epithelial tissue, making it easy for parasites to attach, develop, and obtain nutrients.

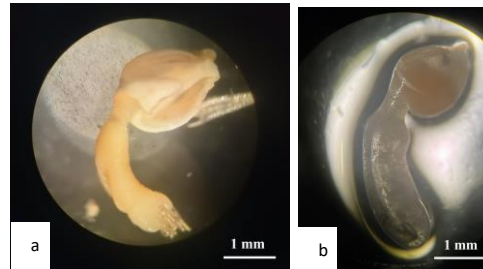


Figure 1. *Octolasmis cor* (a) and *Octolasmis angulata* (b)
Source: Personal documentation

a. *Octolasmis cor*

Octolasmis spp. is pale white, contractile, sprout-shaped, and lives in colonies on the gills of mud crabs. *Octolasmis* spp. consists of several body parts such as the *tergum*, *capitulum*, *scutum*, *peduncle*, and *carina* (Muttaqin *et al.*, 2018). Morphologically, *Octolasmis* spp. has a body length between 0.01 and 0.15 cm. Based on observations, the *Octolasmis* species that infect mud crabs are *O. cor* and *O. angulata*. According to research by Helfiani *et al.* (2023), *O. cor* has a branched *scutum* with widened branch tips, an inconspicuous *tergum*, and a body consisting of a *capitulum* and a *peduncle*.

Taxonomically, *Octolasmis cor* is classified as follows:

Phylum	: Arthropoda
Class	: Thecostraca
Subclass	: Cirripedia
Ordo	: Scalpellomorpha
Family	: Poecilasmatidae
Genus	: <i>Octolasmis</i>
Species	: <i>Octolasmis cor</i>

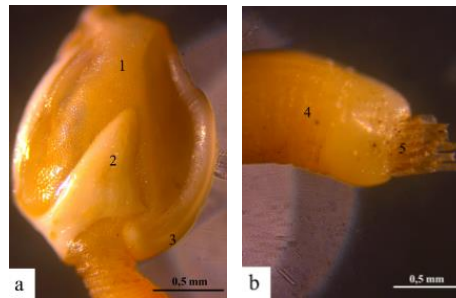


Figure 2. Morphology of *Octolasmis cor*: capitulum (a) and peduncle (b) (40x magnification)

Note: 1: tergum, 2: scutum, 3: carina, 4: peduncle, and
5: maxillule

Source: Personal documentation

Based on observations, *Octolasmis cor* has morphological characteristics consisting of a body composed of capitulum such as tergum, scutum, and carina, as well as a peduncle and maxillule. The capitulum of *O. cor* is oval-shape and protected by a calcareous shell. It has an inconspicuous tergum, a narrow carina, and a tapering scutum with widened branch tips (Figure 2a). *O. cor* has a dotted surface on the capitulum and peduncle, and there is a maxillule at the tip of the peduncle (Figure 2b).

b. *Octolasmis angulata*

The results of research on the *Octolasmis* parasite also found the *O. angulata* species with the characteristic of having body parts consisting of a capitulum in the form of a tergum, carina, scutum and peduncle. Capitulum *O. angulata* is oval-shape and covered with a calcareous shell, with a distinct tergum, a narrow carina, and a non-tapering scutum (Figure 3a). No maxillules were found, but there were spots on the peduncle and capitulum (Figure 3b). This is consistent with the opinion of Indarto *et al.* (2021) that the *O. angulata* has a thin, L-shaped scutum and a narrower carina.

Taxonomically, the classification of *Octolasmis angulata* is as follows:

Phylum	: Arthropoda
Class	: Thecostraca
Subclass	: Cirripedia
Ordo	: Scalpellomorpha
Family	: Poecilasmatidae
Genus	: <i>Octolasmis</i>
Species	: <i>Octolasmis angulata</i>

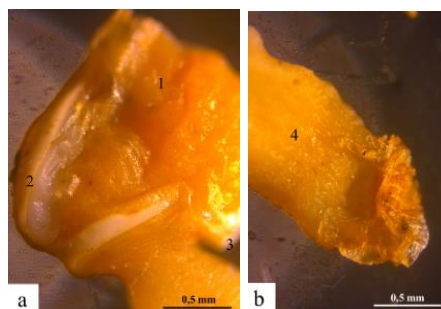


Figure 3. Morphology of *Octolasmis angulata*: capitulum (a) and peduncle (b) (40x magnification)

Note: 1: tergum, 2: scutum, 3: carina, and 4: peduncle

Source: Personal documentation

Prevalence and Intensity of *Octolasmis* spp. Parasites

The results of research conducted during the entry of mud crab samples from August 21-September 23, 2025, showed that mud crabs in the South Sulawesi area were infected with the *Octolasmis cor* and *Octolasmis angulata*. The results of the calculation of the prevalence and intensity of the *Octolasmis* spp. can be seen in Table 3 below.

Table 3. Prevalence and intensity values of *Octolasmis* spp. in mud crabs (*Scylla* sp.) in South Sulawesi

No	Parasite	ΣOS (crab)	ΣIS (crab)	BW (g/r)	CW (cm)	ΣParasite (ind)	Intensity (Ind/crabs)	Prevalence (%)
1	<i>Octolasmis cor</i>	30	8	175-300	9,5-12	1106	138	26,7
2	<i>Octolasmis angulata</i>	30	13	220-350	9,5-13	694	53	43,3

Note: ΣOS: number of crab samples observed, ΣIS: number of crab samples infected with parasites, BW: body weight, CW: carapace width

The highest prevalence value was found in the *O. angulata* parasite at 43,3%, with 13 crabs infected out of 30 samples observed. According to Williams and Williams (1996), a prevalence of 43% is categorized as “commonly”, indicating that this parasite commonly infects mud crab. The lowest prevalence value was found in the *O. cor* parasite at 26,7%. A prevalence of 26% falls into the “often” category, indicating that this parasite often infects mud crabs (Williams & Williams, 1996).

The highest intensity value was found in the *O. cor* parasite at 138 ind/crabs. This result indicates that *O. cor* parasite infection is categorized as “very heavy” which may potentially affect gill function and contribute to physiological stress in affected crabs (Williams & Williams, 1996). The lowest intensity value was found in the *O. angulata* parasite at 53 ind/crabs. According to Williams and Williams (1996), an intensity of 53 ind/crabs is categorized as “heavy” and can cause a stressful impact in mud crabs (Danesti *et al.*, 2022).

Prevalence and Intensity of *Octolasmis* spp. Parasites in Mud Crabs (*Scylla* sp.)

The results showed that the prevalence value category of *Octolasmis cor* parasites was classified as "often infection" and *Octolasmis angulata* was classified as "commonly infection", while the parasite intensity categories of *O. cor* and *O. angulata* were "very heavy" and "heavy", respectively. This pattern indicates that the parasite distribution of parasites is uneven in the population, meaning that only some crabs are infected, but those individuals carry a high parasite burden. This imbalance between prevalence and intensity indicates the presence of parasite aggregation in certain hosts (Maulida *et al.*, 2022).

High infection intensity is not universal and is influenced by the host's physiological condition and environmental factors. Crabs that are weak, stressed, or malnourished tend to have a reduced immune response, making them more susceptible to heavy infestations (Hall *et al.*, 2022). In addition to internal factors, water quality also plays a role in differences in parasite intensity (Muttaqin *et al.*, 2018). Several studies in Kubu Raya and Demak Regency reported high prevalence with relatively low intensity at DO levels of 3.05–3.56 mg/L and salinity of 6–10 ppt, which are below the optimal range for mud crabs (Helfiani *et al.*, 2023; Herlinawati, 2017). These conditions are thought not to fully support the massive development of parasites in each individual.

In contrast, research in Segintung Village, Seruyan Regency, showed low prevalence but high intensity, indicating that infestation is focused on certain individuals with greater severity (Handayani & Rozikin, 2019). Environments with low dissolved oxygen, high salinity, and high temperatures have the potential to accelerate the increase in parasite burden in physiologically weakened hosts (Irvansyah *et al.*, 2012).

Ecologically, *Octolasmis* spp. is a common organism found in aquatic environments and at low intensities does not harm mud crabs (Herlinawati *et al.*, 2017). However, declining water quality characterized by salinity fluctuations, low DO, increased temperature, and high organic matter, can trigger physiological stress and reduce host immunity, thereby increasing the intensity of infestation, especially in the gills as the main respiratory organ. This condition is in line with the statement by Ruth and Ruth (2003) that waters with high organic matter content have the potential to increase parasite populations.

CONCLUSION

Based on the research results, two types of *Octolasmis* spp. were found in mud crabs (*Scylla* sp.) in South Sulawesi, namely *O. cor* and *O. angulata*. The prevalence values of *O. cor* and *O. angulata* were 26% and 43%, respectively, and the intensity was 138 ind/crabs and 53 ind/crabs, respectively. *O. cor* and *O. angulata* infections were categorized as "infeksi seringkali" (*often*) and "infeksi umum" (*commonly*), respectively. However, in terms of intensity, *O. cor* and *O. angulata* infections were categorized as "sangat parah (*very heavy*)" and "parah (*heavy*)".

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